

Utah Antidegradation Review Implementation Guidance

Version 2.0

[3/17/2015](#)~~[2/6/2015](#)~~

DRAFT FOR COMMENT

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This draft has not been approved by DWQ management

DOCUMENT VERSIONS

<u>Version</u>	<u>Date</u>	<u>Summary of Changes</u>
<u>1.0</u>	<u>May 2010</u>	<u>Original document issued.</u>
<u>1.1</u>	<u>May 2012</u>	<ul style="list-style-type: none">• <u>Minor revisions to original document including some formatting and reorganization.</u>• <u>Added procedures for ranking and weighting POCs.</u>
<u>2.0</u>	<u>TBD</u>	<ul style="list-style-type: none">• <u>Added procedures for identifying POCs for discharges to fresh and salt water terminal lakes, and the Great Salt Lake.</u>• <u>Revised flow chart to clarify the submittal and review process (Figure 2).</u>• <u>Revised procedures for ranking and weighting POCs; added assimilative capacity as a factor to consider. Added an example of detailed quantitative procedures for ranking and weighting POCs (Appendix A).</u>• <u>Added requirement that Alternatives Analysis be stamped by a Professional Engineer.</u>• <u>Added procedures for establishing the Baseline Treatment Alternative.</u>• <u>Revised procedures for selecting the least degrading feasible alternative ("preferred alternative"), including consideration of degradation, total cost, cost effectiveness, affordability and other factors. Added an example of detailed quantitative procedures for ranking alternatives (Appendix A).</u>• <u>Developed supplemental spreadsheet tools for ranking and weighting POCs and alternatives.</u>• <u>Added procedures for General Permits.</u>• <u>Added procedures for 401 Water Quality Certifications.</u>• <u>Added Glossary.</u>• <u>Added List of Acronyms.</u>• <u>Added References.</u>

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1 **GLOSSARY**

2 **ambient condition:** water quality of the receiving water immediately upstream of the point of
3 discharge

4 **assimilative capacity:** the natural capacity of a water body to dilute and absorb pollutants and
5 prevent harmful effects (e.g., damage to public health or physical, chemical, biological integrity
6 of the water)**baseline alternative:** the treatment alternative that meets water quality standards
7 and water quality based permit effluent limits established by the wasteload analysis

8 **beneficial use:** use of waterbody, including protection and propagation of aquatic wildlife,
9 recreation, public water supply, and agricultural supply

10 **Blue Ribbon Fishery:** status administered by the Utah Division of Wildlife Resources and the
11 Blue Ribbon Advisory Council that indicates the waterbody has high quality in the following
12 attributes: fishing, outdoor experience, fish habitat, and economic benefits

13 **designated use:** beneficial use of waterbody as specified in UAC R317-2-13.

14 **existing use:** beneficial use actually attained in a waterbody on or after November 28, 1975
15 (UAC R317-1), or use that would be supported by the water quality, regardless of whether or not
16 they are designated in the water quality standards.

17 **parameter of concern:** a pollutant in the discharge that exceeds or is anticipated to exceed the
18 ambient concentration in the receiving water

19 **reasonable potential analysis:** statistical analysis to determine whether effluent will have the
20 reasonable potential to cause an excursion above State water quality standards

21 **sustainability:** the degree that the management method minimizes the depletion or damage to
22 natural resources

23 **toxic weighting factor:** method to normalize pollutants for differences in toxicity in order to
24 provide the means to compare mass loadings of different pollutants. EPA derives toxic weighting
25 factors from chronic aquatic life criteria (or toxic effect levels) and human health criteria (or
26 toxic effect levels) established for the consumption of fish.

27 **waters of the State of Utah:** all streams, lakes, ponds, marshes, water-courses, waterways,
28 wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of
29 water, surface and underground, natural or artificial, public or private, which are contained
30 within, flow through, or border upon this state or any portion thereof, except that bodies of
31 water confined to and retained within the limits of private property, and which do not develop
32 into or constitute a nuisance, or a public health hazard, or a menace to fish and wildlife, shall
33 not be considered to be "waters of the state" under this definition (Section 19-5-102)

34 | **Waters of the United States:** [waterbodies subject to the provisions of the Clean Water Act.](#)
35 | [Specific waters included under this definition are based on federal agencies' interpretation of](#)
36 | [the statute, implementing regulations and relevant caselaw. Refer to EPA for latest guidance on](#)
37 | [determination of waters of the US.](#)

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ACRONYMS

ADR	antidegradation review
AFO	animal feeding operation
BMP	best management practice
BPT	best practicable technology
BU	Beneficial use
CAFO	concentrated animal feeding operation
DEQ	Utah Department of Environmental Quality
DMR	discharge monitoring report
DWQ	Utah Division of Water Quality
EPA	United States Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
NOI	Notice of Intent
NPV	net present value
POC	parameter of concern
POTW	publically owned treatment works such as water reclamation facilities
SEEI	social, economic and environmental importance
SOP	standard operating procedures
TWF	toxic weighting factor
TWPE	toxic weighting pound equivalents
UAC	Utah Administrative Code
UPDES	Utah Pollution Discharge Elimination System
USACE	United States Army Corp of Engineers
WET	whole effluent toxicity
WLA	wasteload analysis
WQBEL	water quality based effluent limit

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1.0 INTRODUCTION

The central goals of the Clean Water Act and the Utah Water Quality Act are to protect, maintain, and restore the quality of Utah's waters. One way in which this is accomplished is through Utah's water quality standards, which consist of: 1) designated uses (e.g., aquatic life, drinking water, recreation), 2) water quality criteria (both numeric and narrative), and 3) antidegradation policy and procedures. The intent of the antidegradation component of our standards is to protect existing in-stream uses, and to maintain high quality waters; those waters that are in better condition than the water quality standards require. ~~Our water quality criteria create a floor below which uses become impaired, whereas our antidegradation policy protects water quality in waters where the quality is already better than the criteria.~~

Utah's antidegradation policy (UAC R317-2-3) provides a decision making process ~~does not prohibit degradation of water quality, unless the Water Quality Board has previously considered the water to be of exceptional recreational or ecological significance (Category 1 or Category 2 waters). Instead the policy creates a series of rules that together~~ to ensure that when degradation of water quality is necessary to accommodate important ~~for~~ social and economic development, every feasible option to minimize degradation is explored. Also, the policy requires that alternative management options and the environmental and socioeconomic benefits of proposed projects are made available to concerned stakeholders.

This document provides the implementation procedures for Utah's antidegradation rules. Utah's Division of Water Quality (hereafter DWQ) is required by Federal Code (40 CFR §131.12(a)) to develop an antidegradation policy and implementation procedures. These procedures and associated rules (UAC R317-2-3) meet these requirements. The implementation procedures discussed in this document were developed in a collaborative process among stakeholders to identify procedures that would meet the intent of antidegradation rules, while avoiding unnecessary regulatory burdens.

~~This first draft of implementation procedures focuses on Utah Pollution Discharge Elimination System (UPDES) permits except for general permits. General permits must meet ADR requirements and implementation procedures for general permits will be forthcoming in future drafts of this guidance.~~ This is the third version of the guidance document. A history of versions and modifications made to the guidance document can be found in Appendix C. Section ~~87.0~~ 87.0 summarizes the portions of the guidance that still need to be completed. ~~are incomplete~~. The absence of guidance for these topics does not negate or delay the requirements for antidegradation reviews required under UAC R317-2-3.

1.1 Antidegradation Goals and Objectives

2.0 THE ANTIDEGRADATION PROCESS

The overarching goal of ADRs is summarized in rule R317.2.3.1 as follows:

79 *“Waters whose existing quality is better than the established standards for the designated*
80 *uses will be maintained at high quality unless it is determined by the Board, after*
81 *appropriate intergovernmental coordination and public participation in concert with the*
82 *Utah continuing planning process, allowing lower water quality is necessary to*
83 *accommodate important economic or social development in the area in which the waters are*
84 *located. However, existing instream water uses shall be maintained and protected. No water*
85 *quality degradation is allowable which would interfere with or become injurious to existing*
86 *instream water uses.”*

87 Antidegradation reviews (ADRs) are required, as part of the permitting process, for
88 any action that has the potential to degrade water quality. Activities subject to ADRs
89 include any activities that require a permit or water quality certification pursuant to
90 federal law. The ADR process involves: 1) classification of surface waters into protection
91 categories, and 2) documenting that activities likely to degrade water quality are
92 necessary and that all State and Federal procedures have been followed to ensure that
93 reasonable steps are taken to minimize degradation. ~~The overarching goal of ADRs is~~
94 ~~summarized in rule R317.2.3.1 as follows:~~

95 ~~*“Waters whose existing quality is better than the established standards for the designated*~~
96 ~~*uses will be maintained at high quality unless it is determined by the Board, after*~~
97 ~~*appropriate intergovernmental coordination and public participation in concert with the*~~
98 ~~*Utah continuing planning process, allowing lower water quality is necessary to*~~
99 ~~*accommodate important economic or social development in the area in which the waters are*~~
100 ~~*located. However, existing instream water uses shall be maintained and protected. No water*~~
101 ~~*quality degradation is allowable which would interfere with or become injurious to existing*~~
102 ~~*instream water uses.”*~~

103

104 2.0 ANTIDegradation Protection Categories

105 **2.1 Assigning Protection Categories**

106 Utah's surface waters are assigned to one of three protection categories that
107 ~~prescribe generally permissible water quality actions. These levels of protection~~ are
108 determined by their existing biological, chemical and physical integrity, and by the
109 interest of stakeholders in protecting current conditions. Antidegradation procedures
110 are differentially applied to each of these protection categories on a parameter-by-
111 parameter basis.

112 *2.1.1 Category 1 Waters*

113 Category 1 waters (as listed in R317-2-12.1) are afforded the highest level of
114 protection from activities that are likely to degrade water quality. This category is
115 reserved for waters of exceptional recreational or ecological significance, or that have
116 other qualities that warrant exceptional protection. Once a waterbody is assigned
117 Category 1 protection, future discharges of wastewater into these waters are not
118 permitted. However, permits may be granted for other activities (e.g., road
119 construction, dam maintenance, [pesticide/herbicide application](#)) if it can be shown that
120 water quality effects will be temporary and that all appropriate Best Management
121 Practices (BMPs) have been implemented to minimize degradation of these waters.
122 [Discharges that were permitted prior to February 1994, when the rule establishing](#)
123 [Category 1 waters was promulgated, are considered grandfathered.](#)

124 *2.1.2 Category 2 Waters*

125 Category 2 waters (as listed in R317-2-12.2) are also afforded a high level of
126 protection, but discharges to these waters are permissible, provided no degradation of
127 water quality will occur or where pollution will result only during the actual construction
128 activity, and where ~~best management practices~~ [BMPs](#) will be employed to minimize
129 pollution effects. In practice, this means that all wastewater parameters should be at or
130 below background concentrations of the receiving water for activities that are not
131 temporary and limited. As a result of this stipulation, the Level I and Level II ADR
132 provisions discussed in these implementation procedures are not required for Category
133 2 waters.

134 *2.1.3 Category 3 Waters*

135 All surface waters of the State are Category 3 waters unless otherwise designated as
136 Category 1 or 2 in UAC R317-2-12. Discharges that degrade water quality are permitted
137 for Category 3 waters provided that 1) existing uses are protected, 2) the degradation is
138 necessary, 3) the activity supports important social or economic development in the
139 area where the waters are located, and 4) all statutory and regulatory requirements are
140 met in the area of the discharge. Antidegradation rules also apply for any proposed new
141 or expanded discharge that is likely to degrade water quality. ADRs require that these
142 proposed actions demonstrate that such proposed projects are necessary to

143 accommodate social and economic development, and that all reasonable alternatives to
144 minimize degradation of water quality have been explored. These implementation
145 procedures provide details about how ADRs are implemented to meet these
146 requirements.

147 **2.2 Procedures for ReAssigning Protection Categories**

148 The intent of Category 1 and Category 2 protection classes is to protect high quality
149 waters. Any person, entity, or DWQ may nominate a surface water to be afforded
150 Category 1 or 2 protections by submitting a request to the Executive Secretary/Director
151 of the DWQ Water Quality Board. DWQ generally considers nominations during the
152 triennial review of surface water quality standards. The nominating party has the
153 burden of establishing the basis for reclassification of surface waters, although DWQ
154 may assist, where feasible, with data collection and compilation activities.

155 *2.2.1 Material to Include with a Reclassification Nomination*

156 The nomination may include a map and description of the surface water; a statement
157 in support of the nomination, including specific reference to the applicable criteria for
158 unique water classification, and available, relevant and recent water quality or biological
159 data. All data should meet the minimum quality assurance requirements used by DWQ
160 for assessing waters of the State, per the requirements in Utah Division of Water
161 Quality: Quality Assurance Program Plan for Environmental Data Operations (DWQ,
162 2014) and associated Standard Operating Procedures (SOP). ~~A description of these~~
163 ~~requirements can be found in the most recent Integrated Report Part 1 Water Quality~~
164 ~~Assessment~~.

165 It is strongly recommended that a petition for reclassification have the support of the
166 local water quality planning authority and watershed advisory group.

167 *2.2.2 Considerations for Appropriate Data and Information to Include with* 168 *Nominations Factors Considered to Increase Protection of Surface Waters*

169 The Water Quality Board may reclassify a waterbody to a more protected category,
170 following appropriate public comment. Evidence provided to substantiate any of the
171 following justifications that a waterbody warrants greater protection may be used to
172 evaluate the request:

- 173 • The location of the surface water with respect to protections already afforded to
174 waters (e.g. on federal lands such as national parks or national wildlife refuges).
- 175 • The ecological value of the surface water (e.g., biological diversity, or the
176 presence of threatened, endangered, or endemic species).
- 177 • Water quality superior to other similar waters in surrounding locales.
- 178 • The surface water is of exceptional recreational or ecological significance
179 because of its unique attributes (e.g., Blue Ribbon Fishery).
- 180 • The surface water is highly aesthetic or important for recreation and tourism.

- 181 • The surface water has significant archeological, cultural, or scientific importance.
182 • The surface water provides a special educational opportunity.
183 • Any other factors the ~~Executive Secretary~~[Board](#) considers relevant as
184 demonstrating the surface water’s value as a resource.

185 The final reclassification decision will be based on all relevant information submitted
186 to or developed by DWQ.

187 *2.2.3 ~~Considerations for Appropriate Data and Information for~~*
188 *~~Consideration~~[Factors Considered](#) to Decrease Protection of Surface Waters*

189 The intent of Category 1 and Category 2 protections is to prevent future degradation
190 of water quality. –As a result, downgrades to surface water protection categories are
191 rare. –However, exceptional circumstances may exist where downgrades may be
192 permitted to accommodate a particular project. For instance, in Utah most surface
193 waters in the upper portions of National Forests are afforded Category 1 protection,
194 which may not be appropriate in specific circumstances. Project proponents may
195 request a classification with lower protection; however, it is their responsibility to
196 provide sufficient justification. –Examples of situations where a reclassification with less
197 stringent protections might be appropriate ~~are~~[follow](#):

- 198 • Failure to complete the project will result in significant and widespread
199 economic harm.
200 • Situations where the surface water was improperly classified as a Category 1 or
201 Category 2 water because the surface water is not a high quality water (as
202 defined by the criteria outlined in 2.2.2).
203 • Water quality is more threatened by not permitting a discharge (e.g., septic
204 systems vs. centralized [waste](#)water treatment).

205 Requests for downgrades to protection should provide the most complete and
206 comprehensive rationale that is feasible. –The request for a reduction in protection may
207 also be considered in concert with the alternatives evaluated through an accompanying
208 Level II ADR. –Proposed projects affecting high quality waters may require more
209 comprehensive analysis than projects affecting lower quality waters.

210 *2.2.4 ~~Public Comment~~ [Process](#) for Proposed Reclassifications*

211 All data and information submitted in support of reclassification will be made part of
212 the public record. In addition to public comment, the DWQ will hold at least one public
213 meeting in the area near the nominated water. If the issues related to reclassification
214 are regional or statewide ~~in nature~~ or of broader public interest, the Division will
215 consider requests for public meetings in other locations. Comments received during this
216 meeting will be compiled and considered along with the information submitted with the
217 nomination.

218 *2.2.5 Reclassification Decision Making Process*

219 The final reclassification decision will be based on all relevant information submitted
220 to or developed by the DWQ. All data will be presented and discussed with the Water
221 | Quality Standards Workgroup. DWQ [will](#) then submit its recommendations regarding
222 reclassifications to the Water Quality Board who makes a formal decision about
223 whether to proceed with rulemaking to reclassify the waterbody. The proposed
224 reclassification is a rule change, and as such will trigger public notice and comment
225 procedures.

226 **3.0 ANTIDegradation Review General Procedures**

227 **3.1 Overview of Antidegradation Review Procedures**

228 ADR reviews for Category 3 waters are conducted at two levels, which are referenced
229 in R317-2-3 as Level I and Level II reviews. Category 1 and Category 2 waters do not
230 require an Antidegradation Review, as degradation of these waters is not allowed.
231 ~~Figure 1 provides an overview of the overall ADR process.~~

232 Level I reviews are intended to ensure that proposed actions will not impair “existing
233 uses”. Level II ADRs assure that degradation is necessary and that the proposed activity
234 is economically and socially important. Level II ADRs are required for any activity that is
235 not temporary and limited in nature and is likely to result in degradation of water
236 quality. The central tenet of these reviews is to ensure that the discharge is necessary,
237 water quality standards will not be violated, and that alternatives to minimize
238 degradation are considered.

239 ~~3.1.12~~ Actions Subject to Antidegradation Provisions

240 Activities subject to ADR requirement include all activities that require a permit or
241 certification under the Clean Water Act. Special considerations for General Permits,
242 §401 Certifications, and Stormwater Permits are provided in Section 7.0.

243 **3.2 Level I Antidegradation Reviews**

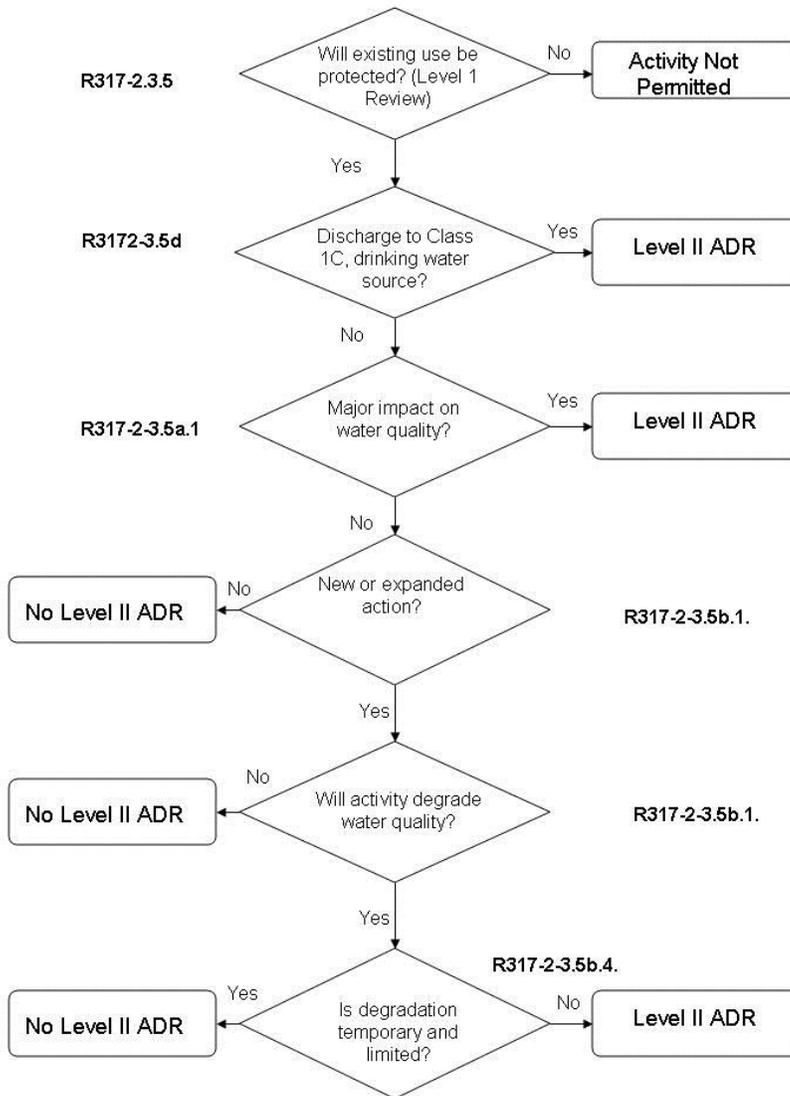
244 Level I reviews are intended to ensure that ~~proposed actions will not impair~~ “existing
245 uses” will be maintained and protected. Existing uses ~~means those are defined as any~~
246 beneficial uses actually attained in a water body on or after November 28, 1975 (UAC
247 R317-1), or uses that would be supported by the water quality, regardless of whether ~~or~~
248 ~~not~~ they are included in the water quality standards. For instance, if a stream is
249 currently ~~only contains designated a~~ warm water fishery ~~species (Beneficial Use (BU)~~
250 Class 3B or 3C), ~~yet whereas~~ it supported a trout fishery (BU Class 3A) at some point
251 after 1975, the “existing use” criteria would be those for BU Class 3Aa (protected for
252 cold water species of game fish and other cold water aquatic life, including the
253 necessary aquatic organisms in their food chain).

254 Neither State nor ~~federal~~ Federal regulations allow water quality permits to be issued
255 if the proposed project will permit impairment of an existing instream use. ~~and in~~
256 order to ensure the protection of existing uses, the Level I review ~~simply asks~~ evaluates
257 whether there are existing uses with protection requirements that are more stringent
258 than the currently designated uses (R317-2-13). ~~DWQ is currently unaware of any~~
259 ~~discrepancies between the existing uses and the designated beneficial use classes in~~
260 R317-2-6.

261 ~~Water quality permits will not be issued if the proposed project will impair existing~~
262 ~~uses.~~

263 | ~~DWQ staff conduct Level I reviews as the first step in any permitting action by~~
264 | ~~comparing the concentration predicted by the waste load analyses (WLA) after mixing~~
265 | ~~to the water criterion for the designated uses (R317-2-13) and more restrictive existing~~
266 | ~~uses.~~ The permit applicant is responsible for submitting ~~adequate~~ necessary effluent
267 | data for DWQ to conduct the Level I ADR. ~~More information and permit applications are~~
268 | ~~available at http://www.waterquality.utah.gov/UPDES/updes_f.htm.~~

269



270
 271 | Figure 1. [The general process for determining whether a Level II ADR is required for a DWQ](#)
 272 [UPDES a permit. Expanded actions are increases in loads or concentrations \(Section 3.3.1\).](#)
 273 [Special considerations for other permits are discussed in Section 3.6.](#)

274

275 **3.3 Level II Antidegradation Reviews**

276 A Level II ADR is required if the receiving water is designated with a 1C Drinking Water
277 Source Use or the [Executive Secretary/Director](#) determines that the discharge may have
278 a major impact on water quality. Otherwise, all of the following conditions must apply
279 before a Level II ADR is required for a proposed activity: 1) it must be a new or
280 expanded action, 2) it must be an action that is regulated by the DWQ, and 3) the action
281 must have a reasonable likelihood of degrading water quality. Additional details for
282 each of the preceding requirements are provided below. [Figure 1 provides a flow chart](#)
283 [to assist with determining whether a Level II ADR is required.](#)

284 ~~3.3.2 Actions Regulated by the DWQ~~
285 ~~the Clean Water Act. Special considerations for General Permits, §401 Certifications,~~
286 ~~and Stormwater Permits are provided below.~~

287 3.3.1 ~~Activities that are Considered to be~~ *New or Expanded Actions*

288 New actions refer to facilities that are being proposed for construction, or actions that
289 are initiated for the first time. Expanded refers to a change in permitted or design
290 concentration or flow and corresponding pollutant loading. Examples of expanded
291 actions include:

- 292 • An increase in permitted concentrations;
- 293 • An increase in permitted flow;

294 New or expanded actions could include increases in discharge concentration resulting
295 from the construction of new or expanded industrial or commercial facilities. In general,
296 Level II ADRs will be conducted for POTWs based on the design basis of the facility, so
297 subsequent Level II reviews would typically only occur during facility planning and
298 design for construction. Periods when treatment systems are being designed,
299 redesigned, or expanded are often ideal opportunities for implementing new
300 technologies or evaluating long-term strategies for pollution control. The intent of this
301 provision is that any POTW capacity expansion would qualify as an action potentially
302 subject to a Level II ADR.

303 A permit authorizes a facility to discharge pollutants without explicit permit limits as
304 long as those pollutants are constituents of waste streams, operations, or processes that
305 were clearly identified during the permit application process, regardless of whether or
306 not they were specifically identified as present in the facility discharges (see
307 memorandum from Robert Perciasepe, Assistant Administrator for Water, to Regional
308 Administrators and Regional Counsels, July 1, 1994, at Pages 2-3). These pollutants are
309 generally treated the same as pollutants with explicit permit limits with regards to ADRs,
310 *i.e.*, if a renewing permit maintains the *status quo*, no additional ADR is required.
311 However, the [Executive Secretary of the Utah Water Quality Board/Director](#) can require a
312 Level II ADR for any project, including renewing permits, if the proposed activity could
313 potentially degrade water quality.

314 ~~3.3.2 Actions Regulated by the DWQ~~

315 ~~Activities subject to ADR requirement include all activities that require a permit or~~
316 ~~certification under the Clean Water Act. Special considerations for General Permits,~~
317 ~~§401 Certifications, and Stormwater Permits are provided below.~~

318 3.3.23 Activities ~~that are n~~ot Considered to Result in Degradation or Additional
319 Degradation

320 Level II ADRs are not required for projects that are not likely to result in degradation
321 of the receiving water. Nor are Level II ADRs typically required for projects when the
322 permit is being renewed with no increase in permitted flow or concentrations. Permits
323 that are being renewed met the ADR requirements when the permit was originally
324 issued and are not required to conduct additional ADRs in the absence of an increase in
325 degradation. A regulated discharge activity may not be considered to result in
326 degradation if one or more of the following apply:

- 327 • Water quality will not be further degraded by the proposed activity (R317-2-
328 3.5.b(1)). Examples include⁴:
 - 329 a. The proposed concentration-based effluent limit is less than or equal to
330 the ambient concentration in the receiving water during critical
331 conditions. ~~;~~
 - 332 b. A UPDES permit is being renewed and the proposed effluent
333 concentration and loading limits are equal to or less than the
334 concentration and loading limits in the previous permit. ~~;~~
 - 335 c. A UPDES permit is being renewed and new effluent limits are to be
336 added to the permit, but the new effluent limits are based on
337 maintaining or improving upon effluent concentrations and loads that
338 have been observed, including variability. ~~;~~
- 339 • The activity will result in only temporary and limited degradation of water quality
340 (see Section 3.3.4). ~~;~~
- 341 • Additional treatment is added to an existing discharge and the facility retains
342 their current permit limits and design capacity. ~~;~~
- 343 • The activity is a thermal discharge that has been approved through a Clean
344 Water Act §316(a) demonstration.

345 For some parameters, assimilative capacity is used when concentrations in the
346 discharge are less than ambient concentrations. For instance, if the pH in a discharge is
347 6 and ambient pH is 7, assimilative capacity for pH will be used and pH may be a
348 parameter of concern for a Level II ADR.

⁴At the time this guidance was prepared, UAC R317-2-3.5.b.1.(d) contains an additional example. This additional example was disapproved by USEPA during the standards approval process and DWQ will remedy this discrepancy in future rulemaking. If a permit was issued relying on the disapproved example, EPA could disapprove the permit. Therefore, the example in question is not included in the Implementation Guidance.

349 | 3.3.4 ~~Activities that are Considered to be~~ Temporary and Limited

350 | ~~This portion of the guidance is incomplete and the reader should contact DWQ for~~
351 | ~~assistance in the interim to determine if the activity will be considered temporary and~~
352 | ~~limited.~~ A ~~Level II~~ ADR review may not be required if the ~~Executive Secretary~~ Director
353 | determines degradation from a discharge qualifies as temporary and limited following a
354 | review of information provided by the applicant (R317-2-3.5b(3) and (4)). The
355 | information provided by applicant should include:

- 356 | • length of time during which water quality will be lowered. ~~As a general rule of~~
357 | ~~thumb, temporary means days or months not years;~~
- 358 | • percent change in ambient conditions;
- 359 | • pollutants affected;
- 360 | • likelihood for long-term water quality benefits to the segment (e.g., as may
361 | result from dredging of contaminated sediments);
- 362 | • whether fish spawning, or survival and development of aquatic fauna will be
363 | affected (excluding fish removal efforts);
- 364 | • degree to which achieving the applicable Water Quality Standards during the
365 | proposed activity may be at risk; and
- 366 | • potential for any residual long-term influences on existing uses.

367 | U.S. Fish and Wildlife Service and the Utah Division of Wildlife Resources should be
368 | consulted to determine if the timing of the project potentially will affect fish spawning.
369 | Clean Water Act Section 402 ~~g~~ General ~~p~~ Permits, CWA Section 404 ~~n~~ Nationwide and
370 | ~~g~~ General ~~p~~ Permits, or activities of short duration and limited impact may be deemed to
371 | have temporary and limited effects on water quality. See Section ~~3.67.0~~ for additional
372 | detail.

373 | The determination of whether an activity is considered temporary and limited will be
374 | made where there is a reasonable factual basis to support such a conclusion. As a
375 | general rule of thumb, temporary means days or months, not years, and covers
376 | activities that lower water quality on a non-permanent basis such as during construction
377 | or optimization.

378 | **3.4 ~~Responsibilities~~ for Completing Level II ADR Documentation**

379 | Early and frequent communication should occur between applicants and DWQ staff.
380 | The applicant (owner), or owner's representative, is responsible for compiling the
381 | information required for the selection of Parameters of Concern (Section 4.0),
382 | Alternatives Analysis (Section 5.0), and the Statement of Social, Environmental, and
383 | Economic Importance (Section 6.0) ~~and selecting the preferred option~~. The applicant is
384 | ~~also~~ responsible for recommending the parameters of concern and the preferred
385 | alternative to DWQ. ~~However~~, DWQ staff will assist where possible and provide timely
386 | comments to draft material to avoid delays in the permitting process. Much of this

387 information is ~~compiled~~prepared for other purposes such as a Facility Plan. The
388 suggested process for conducting Level II ADRs is shown in Figure 2.

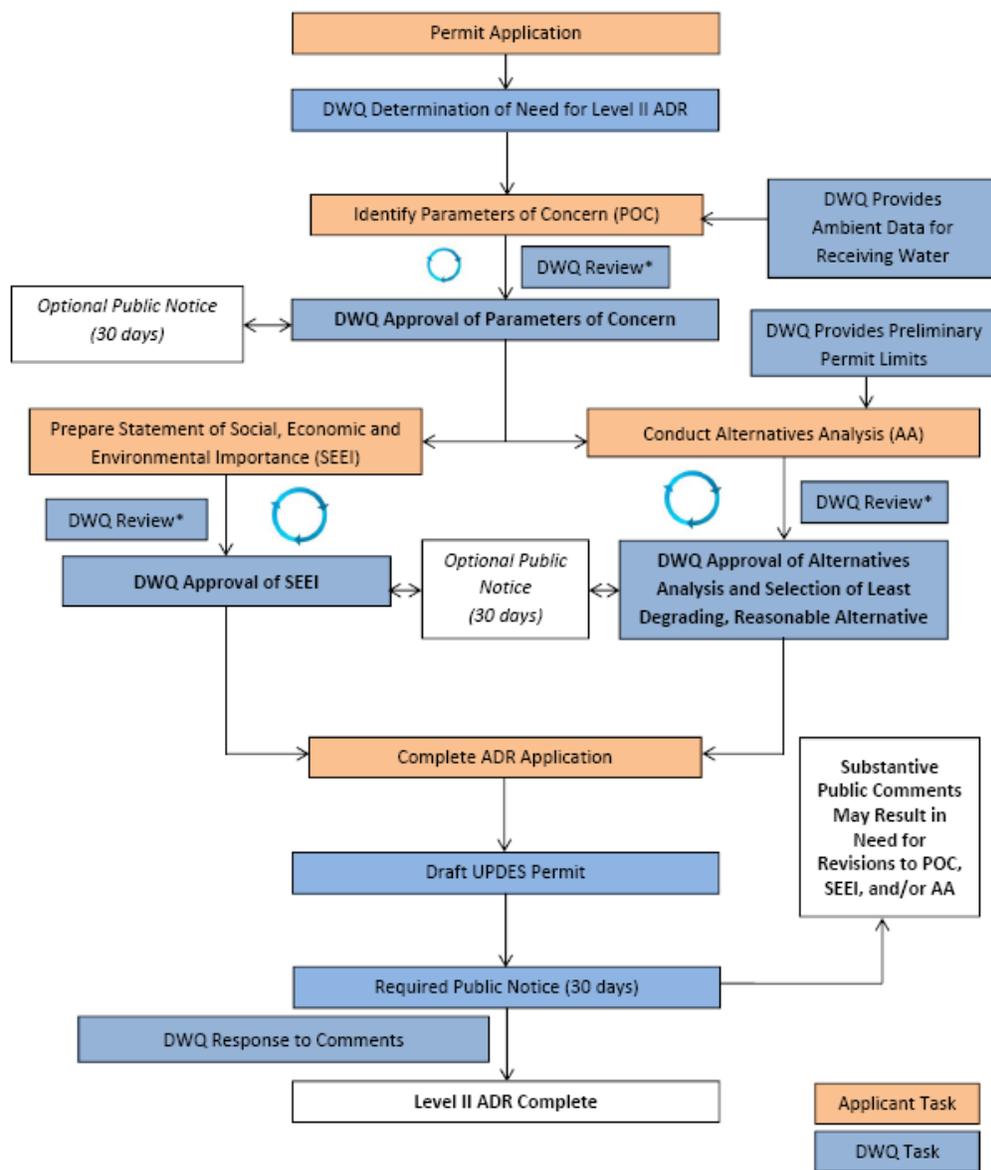
389 For new and expanded discharges, the Alternatives Analysis must be prepared under
390 the supervision of and stamped by a Professional Engineer registered with the State of
391 Utah. DWQ may grant an exception from this requirement under certain circumstances,
392 such as the alternatives considered potentially feasible do not include engineered
393 treatment alternatives.

394 **3.5 Timing of Level II ADRs and Interim Submittals**

395 ADR issues should be considered as early in the permitting or design process as
396 possible. Properly timed Level II ADRs are the most efficient use of time and resources.
397 For instance, many discharges already consider many of the requirements of Level II
398 alternative analyses (Section 5.0) while planning for construction of new facilities or
399 upgrades/expansion to existing facilities. Early planning also allows time to develop an
400 optional work plan which clearly defines a scope of work for developing alternatives.
401 The work plan minimizes miscommunication between DWQ staff and applicants and
402 documents decision points critical to the ADR. The work plan may be put out for public
403 comment, at the applicant's discretion, so that stakeholder concerns can be addressed
404 early in the process, which is much easier and less time consuming than addressing
405 concerns at the end of the permitting process. Finally, early notification provides
406 sufficient time for the DWQ and applicants to work together to ensure that sufficient
407 data are available to generate defensible permit limits. The DWQ suggests that
408 whenever possible applicants initiate ADR processes one year or longer prior to the
409 desired date of a permit. The actual time required to complete the ADR is dependent
410 on the complexity of the ADR.

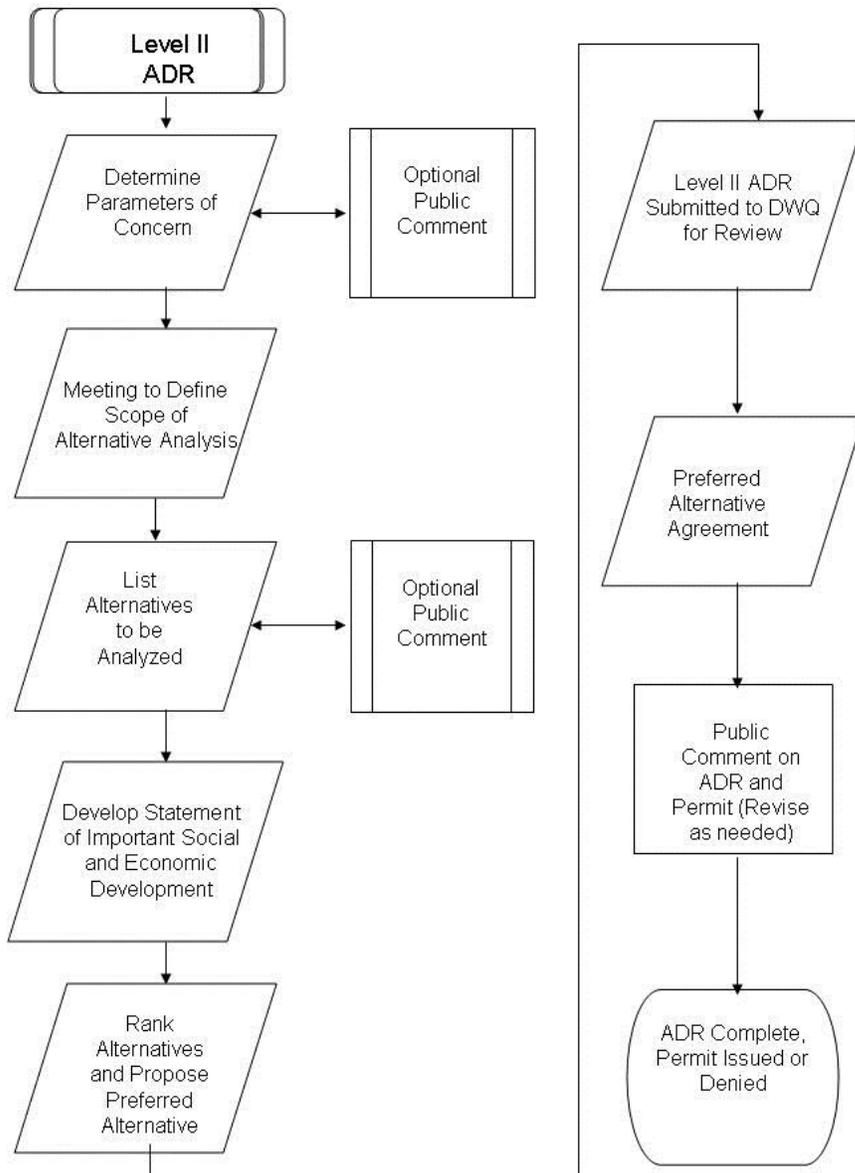
411 Figure 2 shows the elements required for completing a Level II ADR, including interim
412 submittals and agency review.

413



414
415

Figure 2. Process for completing a Level II Antidegradation Review (ADR).



416
417
418

Figure 2. Suggested process for completing a Level II Antidegradation Review (ADR).

419 **3.6 Public and Interagency Participation in ADRs**

420 Public participation is ~~an important~~ required part of the ADR process. Public notice
421 of antidegradation review findings, solicitations of public comment and maintenance of
422 antidegradation review documents as part of the public record help ensure that
423 interested parties can be engaged and involved throughout the review process. In
424 addition, intergovernmental coordination and review is required prior to any action that
425 allows degradation of water quality of a surface water.

426 **3.6.1 Required Public Notification Process**

427 ~~Ultimately, the~~ completed and signed ADR and associated documentation will be
428 made available for public comment through the processes required for ~~UPDES~~ permits
429 (Figure 2). Typically, the required public notice will occur with the draft UPDES permit
430 just prior to issuance. For POTWs that obtain funding from DWQ for construction, the
431 ADR will be public noticed with the Environmental Assessment document and
432 determination, required by NEPA.

433 DWQ is responsible for responding to comments from the mandatory public comment
434 period. The applicant may be required to conduct additional evaluation if substantive
435 comments are received.

436 **3.6.2 Optional Public Notification**

437 ~~However,~~ the applicant may opt for earlier reviews upon completion of a work plan
438 that defines the parameters of concern and the alternatives to be considered for the
439 Level II ADR alternatives analysis. The primary purpose of these optional early reviews is
440 to identify stakeholder project concerns early in the permitting process when the
441 comments can be addressed most efficiently. If an early review is conducted, concerned
442 members of the public should use ~~the~~ is work plan comment period to identify general
443 concerns with the proposed activity, additional parameters of concern that warrant
444 consideration, or additional treatment alternatives that should be considered. Figure 2
445 identifies decision points in the process when DWQ recommends that the applicant
446 solicit optional public comments.

447 DWQ will facilitate any optional public comment opportunities by making the
448 documents available on DWQ's website and the State's Public Notice website.
449 ~~Responding to comments for any optional public comment opportunities is the~~
450 ~~responsibility of the applicant.~~ For the optional public comment periods, DWQ can be
451 the recipient of the comments but the applicant has the responsibility of addressing the
452 comments. A comment response document is not required, but DWQ recommends that
453 the applicant respond to the comments in writing. If DWQ is not the recipient of the
454 comments, the applicant should share the comments received with DWQ in a timely
455 manner. ~~DWQ responds to comments for the mandatory public comment period prior~~
456 ~~to issuing the permit.~~

457 | 3.6.23 *Intergovernmental Coordination and Review*

458 | Intergovernmental coordination is required prior to approving a regulated activity
459 | that would degrade a surface water. This coordination will be conducted at a level
460 | deemed appropriate by the ~~Executive Secretary~~Director and will include any
461 | governmental agency requesting involvement with the ADR.

462 **4.0 IDENTIFICATION OF THE LEVEL II ADR: PARAMETERS OF**
463 **CONCERN**

464 Parameters of concern (POC) are evaluated in the Level II ADR. ~~Only p~~Parameters in
465 the discharge that exceed, or potentially exceed, ambient concentrations in the
466 receiving water should be considered in selecting the parameters of concern. POCs
467 should be identified, ranked and weighted, and submitted to DWQ for review and
468 approval prior to initiation of the alternatives analysis.

469 **4.1 Determination of the Parameters of Concern**

470 The applicant, working with DWQ, should review all available data, from the discharge
471 and the receiving water, and prepare a list of parameters that will be evaluated
472 (potential parameters of concern). DWQ will provide any available data from the
473 receiving water to the applicant. In cases where effluent or receiving water quality data
474 does not exist or is limited, the applicant may voluntarily conduct supplementary
475 sampling and analysis in order to reduce uncertainty associated with identifying POCs.

476 The initial starting point for identifying potential POCs should be the priority
477 pollutants that are known to be or believed to be present in the effluent, as listed in the
478 permit application forms (EPA Form 2e [http://www.waterquality.utah.gov/UPDES/](http://www.waterquality.utah.gov/UPDES/updes_f.htm)
479 updes_f.htm~~EPA Form 2C.pdf~~). ~~—~~ ~~but~~ ~~o~~Other parameters may be added or removed
480 depending on the nature of the proposed project and the characteristics of the receiving
481 water (UAC R317-2-3.5.b). The following are considerations for selecting parameters of
482 concern:

- 483 1. Is the parameter already included in an existing permit? Parameters with
484 limits in the discharge permit are generally considered POCs.
- 485 2. Are there any parameters in the effluent, or expected to be in the
486 effluent, that exceed ambient concentrations in the receiving water?

487 Ambient concentrations are determined by DWQ at critical conditions
488 and provided to the applicant. Typically, ambient conditions are based on
489 the most recent 10 years of data. Critical condition for bioaccumulative
490 toxics is considered the 80th percentile concentration and for
491 conventional pollutants and non-bioaccumulative toxics the average
492 concentration. The applicant may elect to collect water quality data to
493 reduce uncertainty and assist DWQ in determining existing ambient
494 concentrations.

495 The effluent concentrations are the permitted effluent limits or discharge
496 concentration of the baseline treatment alternative. For parameters that
497 do not warrant permit effluent limits based on DWQ's reasonable
498 potential analysis, the 80th percentile of the effluent concentrations

499 | should be used. If no discharge data ~~is-are~~ available for the baseline
500 | treatment alternative, the concentration should be estimated based on
501 | pilot studies, literature values, manufacturer's guidelines and/or best
502 | professional ~~judgement~~judgment.

503 | In cases when the available data are limited, comparisons between
504 | effluent/permitted and ambient concentrations may be conducted using
505 | methods that minimize type II errors, *i.e.*, erroneously concluding that a
506 | pollutant will not degrade water quality.

507 | ~~Is the parameter already included in an existing permit?~~

508 | ~~3. Are parameter concentrations and/or loads exceeding or projected to~~
509 | ~~exceed the current permitted load or design basis?~~

Comment [NvS1]: Propose to remove this clause, as it is more relevant to the requirement to conduct a Level II review than identifying POCs.

510 | ~~4-3.~~ Are there any parameters that are considered to be important by DWQ
511 | or the general public? For instance, nutrients or bioaccumulative
512 | compounds may be of concern for some surface waters. For discharges
513 | to Class 1C drinking water sources, any substances potentially deleterious
514 | to human health may be considered.

515 | ~~5. Are there parameters in the effluent that are known to potentially~~
516 | ~~degrade the existing beneficial uses of the receiving water?~~

Comment [NvS2]: Propose to remove. This seems redundant to the previous tests.

517 | 4. Is the receiving water listed as impaired for any parameters? Parameters
518 | for which the receiving water is listed as impaired and have an ongoing or
519 | approved TMDL are not considered as part of the ADR and are addressed
520 | through the TMDL program.

521 | 5. Is the discharge of the parameter temporary and limited? Refer to
522 | Section 3.3.4 for guidance on what qualifies as temporary and limited.
523 | Parameters that are determined to be temporary and limited are not
524 | considered parameters of concern.

525 | 6. Is the discharge to a freshwater terminal lake? Additional analysis is
526 | required to evaluate the degradation and accumulation of the parameter
527 | in the lake environment.

528 | ~~6-7.~~ Is the discharge to the Great Salt Lake? Due to uncertainties in the
529 | biogeochemical transformation and toxicity of parameters in the Great
530 | Salt Lake environment, parameters of concern will be determined on a
531 | case-by-case basis utilizing the best available information regarding
532 | ambient conditions and assimilative capacity.

533 | ~~The applicant, working with DWQ, should review all available data, from the discharge~~
534 | ~~and the receiving water, and prepare a list of parameters which will be evaluated. DWQ~~

535 ~~will provide any available data from the receiving water to the applicant.~~ The list of
536 parameters of concern and parameters evaluated but not considered POCs,
537 and including supporting rationale, should must be submitted to DWQ. DWQ will review
538 the list and provide preliminary approval pending public comment. Meetings between
539 the applicant and DWQ are anticipated to be the most efficient way to resolve
540 differences regarding parameters to be considered in the Level II ADR.

541 Once the list of parameters of concern has been agreed to between DWQ and the
542 applicant, the list could may be made available to the public by DWQ for an optional
543 comment period (see Section 3.6.27.1). After a 30-day comment period, the list may be
544 refined or approved. This list and associated rankings will form the basis for further
545 activities of the ADR and will ultimately be used to select the least degrading project
546 alternative (Section 5).

547 **4.21 Ranking and Weighting the Parameters of Concern**

548 If there is more than one parameter of concern, The parameters of concern may
549 need to be ranked, ~~or~~ and/or weighted, in order to determine overall water quality
550 degradation of a given ~~treatment~~ alternative. Since no single objective method is
551 possible, the ranking and weighting of POCs will inherently involve some subjectivity and
552 professional judgment, and should be developed in close consultation with DWQ.
553 Potential R ranking and weighting factors considerations are provided below. The basis
554 of the ranking and weighting of POCs should be shall be justified and documented in the
555 ADR application, and approved prior to initiating the alternatives analysis. Examples of
556 detailed quantitative ranking and weighting procedures are provided in Appendix A.

557 1. The amount of assimilative capacity available in the receiving water should be
558 a consideration in determining the relative importance of the parameter in the
559 discharge. POCs with greater assimilative capacity in the receiving water are
560 generally considered less important.

561 ~~1.2.~~ For toxic POCs, using consideration of the EPA's toxic weighting factors
562 (TWF) to calculate toxic weighted pound equivalents (TWPE) for ranking and
563 weighting the POCs may be appropriate. EPA derives TWFs from chronic
564 aquatic life criteria (or toxic effect levels) and human health criteria (or toxic
565 effect levels) established for the consumption of fish in order to account for
566 differences in toxicity across pollutants and to provide the means to compare
567 mass loadings of different pollutants (EPA 2012). Other factors may be more
568 appropriate for ranking toxic POCs than TWF on a case-by-case basis
569 depending on site specific considerations such as the available assimilative
570 capacity for each toxicant or downstream impacts associated with a particular
571 toxicant. Additional guidance regarding ranking and weighting toxic pollutants
572 using TWFs is provided in Appendix A.

573 ~~2.3.~~ For non-toxic POCs, ranking and weighting factors should reflect the
574 relative potential impact of the POC on the beneficial uses of the receiving
575 water. As this determination involves application of best professional
576 judgment, the weighting factors will need to be developed in consultation with

- 577 DWQ. [An example of ranked and weighted non-toxic POCs is provided in Table](#)
 578 [4-1.](#)
 579 ~~3. In the case where both toxic and non-toxic POCs are identified, ranking and~~
 580 ~~weighting will be based on best professional judgment based on site-specific~~
 581 ~~considerations.~~
 582 [4. Other factors to consider include the sensitivity of the receiving water or](#)
 583 [downstream waters to the POC and uncertainty associated with the estimated](#)
 584 [ambient and/or discharge concentration/load.](#)
 585
 586
 587

[Table 4-1: Example Ranking and Weighting of Non-Toxic Parameters of Concern](#)

Parameter	Rank	Weight
Total Phosphorus	1	40%
BOD	2	30%
TSS	3	20%
Total Nitrogen	4	10%
		100%

588 [Table 4-1: Example Ranking and Weighting of Non-Toxic Parameters of Concern](#)

589 **[4.3 Optional Public Notice of the Parameters of Concern](#)**

590 [Once the POCs are selected, an optional public comment period may be conducted](#)
 591 [\(see Section 3.6.2\). If no optional reviews are conducted, the public has an opportunity](#)
 592 [to comment during the mandatory UPDES public comment period.](#)

593 **5.0 LEVEL II ADR: ALTERNATIVES ANALYSIS OF LEVEL II ADRS**

594 ~~As the name suggests,~~ The alternatives analysis requires, to the extent
595 practicable/feasible, documentation of the costs and water quality benefits of alternative
596 treatment/effluent management options. The purpose of ~~an~~ the alternatives analysis is
597 to evaluate whether there are any reasonable non-degrading or less degrading
598 alternatives for the proposed activity.

599 **5.1 Establishing the Baseline Alternative**

600 The Alternatives Analysis requires selecting the baseline alternative, which is defined
601 as the alternative that meets designated uses and associated criteria through water
602 quality based permit effluent limits established by the wasteload analysis or TMDL and
603 any other categorical limits or secondary standards. The cost of the baseline alternative
604 must be estimated for the purpose of assessing the cost reasonableness of less
605 degrading alternatives.

606 **5.2.1 Development of a Scope of Work for Level II ADR Alternatives**
607 **Analysis**

608 The intent of this section is to ~~provide outline~~ a collaborative process to define ~~the~~
609 scope of work for a Level II review which allows for analysis and document preparation.
610 This step is critical, as the level of effort for the alternatives analysis will depend on the
611 size and complexity of the project and the relative importance and sensitivity of the
612 receiving water.

613 **5.2.1 Collaborative Scoping**

614 The first suggested step in the scoping process will be to convene a meeting between
615 the applicant, project consultants, and DWQ to identify less degrading alternatives to be
616 considered and the level of detail appropriate for the alternatives analysis.

617 ~~review~~ The requirements for the scope of the alternatives analysis are found in R317-
618 2-3.5 ~~as shown below~~:

619 *“For proposed UPDES permitted discharges, the following list of alternatives should*
620 *be considered, evaluated and implemented to the extent feasible:*

- 621 (a) *innovative or alternative treatment options*
- 622 (b) *more effective treatment options or higher treatment levels*
- 623 (c) *connection to other wastewater treatment facilities*
- 624 (d) *process changes or product or raw material substitution*
- 625 (e) *seasonal or controlled discharge options to minimize discharging during critical*
626 *water quality periods*
- 627 (f) *pollutant trading*
- 628 (g) *water conservation*
- 629 (h) *water recycle and reuse*
- 630 (i) *alternative discharge locations or alternative receiving waters*
- 631 (j) *land application*

- 632 (k) total containment
- 633 (l) improved operation and maintenance of existing treatment systems
- 634 (m) other appropriate alternatives...

635
636 ~~An option more costly than the cheapest alternative may have to be implemented~~
637 ~~if a substantial benefit to the stream can be realized. Alternatives would generally be~~
638 ~~considered feasible where costs are no more than 20% higher than the cost of the~~
639 ~~discharging alternative, and (for POTWs) where the projected per connection service~~
640 ~~fees are not greater than 1.4% of MAGI (median adjusted gross household income),~~
641 ~~the current affordability criterion now being used by the Water Quality Board in the~~
642 ~~wastewater revolving loan program. Alternatives within these cost ranges should be~~
643 ~~carefully considered by the discharger. Where State financing is appropriate, a~~
644 ~~financial assistance package may be influenced by this evaluation, i.e., a less~~
645 ~~polluting alternative may receive a more favorable funding arrangement in order to~~
646 ~~make it a more financially attractive alternative."~~

647 ~~5.2 Establishing the Baseline Treatment Alternative~~

648 ~~The Alternatives Analysis requires selecting the baseline treatment alternative, which~~
649 ~~is defined as the treatment alternative that meets water quality standards and water~~
650 ~~quality based permit effluent limits established by the wasteload analysis. The cost of~~
651 ~~the baseline treatment alternative must be estimated for the purpose of assessing the~~
652 ~~cost reasonableness of less degrading alternatives.~~

653 ~~5.2.23 General Considerations for Selecting Treatment Alternatives for~~ 654 ~~Consideration/Evaluation~~

655 ~~The number of alternatives to be considered and the extent of planning details for~~
656 ~~alternative analyses may depend on the nature of the facility, size of the proposed~~
657 ~~discharge, the magnitude of degradation, and the characteristics of the receiving water.~~
658 ~~This section outlines screening procedures for determining reasonable alternatives that~~
659 ~~are appropriately scaled to the proposed project. The alternatives specified here are~~
660 ~~guidelines and may be modified from public comments or at the Executive~~
661 ~~Secretary/Director's discretion.~~

662 ~~For many projects, the Facility Plan documents the selection of the preferred~~
663 ~~treatment option and may be sufficient to meet the alternatives analysis requirement of~~
664 ~~the ADR depending on the specific parameters of concern. The following guidelines~~
665 ~~should be considered when defining the scope of work for the alternatives analysis:~~

- 666 1. The feasibility of all alternatives should be examined before inclusion in the
- 667 options to be reviewed in more detail. If an option is initially determined not to
- 668 be feasible, it should does not need to be considered further. As an example,
- 669 before pollutant trading is considered, willing partners in such trading should be
- 670 identified or the potential for trading should exist.

- 671 2. Innovative or alternative treatment options should be limited to proven or
672 successfully piloted processes.
- 673 3. The treatment options subject to review should focus on those which have the
674 greatest potential for water quality improvement for the parameters of concern.
675 Flexibility to modify the treatment process to address potential future changes in
676 waste streams or treatment requirements should also be considered.
- 677 4. When an instream need for the discharge water is deemed by the [Executive](#)
678 [Secretary/Director](#) to be of significant importance to the beneficial use (i.e., if
679 removal of the discharge would result in a detrimental loss of stream flow),
680 evaluation of reuse, land disposal or total containment may be unnecessary.
- 681 5. Alternatives may be ranked in order of potential for parameter reduction.
682 Preference should be given to processes that have the greatest overall [positive](#)
683 effect on water quality. Typically, these highest ranked processes will have the
684 greatest reduction in pollutant load and affect the greatest number of
685 parameters of concern.
- 686 6. Before improved operations and maintenance are considered as a way to
687 prevent degradation, specific operation or maintenance activities should be
688 identified. If [the Executive Secretary/Director](#) and the applicant agree, a third
689 party may be used to assess potential for operations and maintenance
690 improvements.

691 [5.4—Special Project-Specific Scoping Considerations](#)

692 For many projects, the Facility Plan documents the selection of the preferred
693 treatment option and may be sufficient to meet the alternatives analysis requirement of
694 the ADR depending on the specific parameters of concern. ~~The number of alternatives
695 to be considered and the extent of planning details for alternative analyses may depend
696 on the nature of the facility, size of the proposed discharge, the magnitude of
697 degradation, and the characteristics of the receiving water. This section outlines
698 screening procedures for determining reasonable alternatives that are appropriately
699 scaled to the proposed project. The alternatives specified here are guidelines and may
700 be modified from public comments or at the Executive Secretary's discretion.~~

701 All discharges requiring a permit must be provided with a level of treatment equal to
702 or exceeding the requirements in R317-3 for technology based effluent limitations. As
703 provided in R317-[32](#), minimum technology based treatment requirements for POTWs
704 consist of secondary treatment and applicable limitations and standards. The
705 technology based review for POTWs in the Clean Water State Revolving Fund (SRF)
706 process is accomplished through the Facility's Plan and Environmental Assessment. The
707 requirements of the process include an investigation of project need, alternatives,
708 effluent limitations, future conditions, and an Environmental Assessment. The
709 technology based review for POTWs subject to the SRF process generally is satisfied on

710 completion of the Facility Plan, Environmental Assessment, public participation, and
711 DWQ approval. -The technology based review for POTWs that are not in the SRF process
712 is conducted through the UPDES permitting process.

713 The technology based review for non-POTW facilities likewise is conducted during the
714 UPDES permitting and technology based requirements and are applied when the permit
715 is drafted. DWQ has adopted categorical standards for discharges from various types of
716 industries. Existing industrial discharges are required to achieve the best conventional
717 pollutant control technology for conventional pollutants and the best available
718 technology for nonconventional and toxic pollutants. Certain new industrial discharges
719 are required to comply with new source performance standards based on the best
720 available demonstrated control technology. -Effluent limitations for parameters or
721 industries not covered by the categorical standards and limitations are established on a
722 case-by-case basis, based on best professional judgment. -The technology review is
723 complete when the ~~Executive Secretary~~Director approves the draft permit.

724 If a Level II review was conducted for the facility for a previous renewal that was
725 based on the design basis of the facility and a Level II review is required for permit
726 reissuance, ~~and if the previous Level II review was based on the design basis of the~~
727 ~~facility,~~ the applicant should include a written statement certifying that: 1) all
728 alternative treatment processes remain applicable and that the applicant is not aware of
729 alternatives that were not previously considered, 2) that reasonable alternative
730 operation and maintenance procedures are not available that would reduce degradation
731 of the receiving water if implemented.

732 5.2.35 Finalizing the Alternatives ~~Work Plan~~Analysis Scope of Work

733 Once a scope of work is agreed to between DWQ and the applicant, the applicant may
734 proceed with completing the alternatives analysis.

735 The applicant may wish to public notice the scope of work for the alternatives
736 analysis. In this case, the scope of work should be documented in a work plan. The
737 work plan can be made available to the public and can be published on the State Public
738 Notice website at the applicant's discretion. ~~The scope of work may be modified in~~
739 ~~response to public comments, at the applicant's discretion.~~-This public comment period
740 may be held concurrent with the comment period for the parameters of concern, both
741 of which are ~~at the applicant's discretion~~optional.

742 ~~For the optional public comment periods, DWQ can be the recipient of the comments~~
743 ~~but the applicant has the responsibility of addressing the comments. -A comment~~
744 ~~response document is not required, but DWQ recommends that the applicant respond~~
745 ~~to the comments in writing. If DWQ is not the recipient of the comments, the applicant~~
746 ~~should share the comments received with DWQ in a timely manner.~~

747 Additional alternatives may be identified during the public comment period or during
748 evaluation of the alternatives. These possible changes to the scope ~~to of~~ the
749 alternatives analyses should be reviewed by the ~~A~~applicant and DWQ for inclusion in the
750 work plan, as needed.

751 **5.3.7 Procedures for Evaluating>Selecting the Preferred Alternative**

752 ~~5.6—Materials to be Submitted with Alternative Analyses~~

753 ~~For the DWQ to fairly evaluate alternative treatments, the following information~~
754 ~~should be provided for each alternative process:~~

- 755 ~~1. A technical description of the treatment process, including construction costs~~
756 ~~and continued operation and maintenance expenses.~~
- 757 ~~2. The mass and concentration of discharge constituents, and a description of the~~
758 ~~discharge location.~~
- 759 ~~3. A description of the reliability of the system.~~
- 760 ~~4. A ranking of each alternative in terms of its relative ability to minimize~~
761 ~~degradation to the receiving water (see Section 5.6).~~
- 762 ~~5. A ranking of each alternative as to how adaptable it would be to potentially~~
763 ~~changing regulatory requirements.~~

764 The procedures presented in this section are intended to be applied to those
765 alternatives that pass initial screening for feasibility. ~~M~~The more detailed quantitative
766 ranking of alternatives by ~~degradation~~degradation and cost effectiveness may be
767 required depending on the size and complexity of the project and importance and
768 sensitivity of the receiving water.

769

770 ~~5.7—Procedures for Evaluating the Preferred Alternative~~

771 ~~5.3.17.1 Applicant Ranking of Treatment Alternatives by Degradation~~

772 The alternatives should be ranked from the least-degrading to the most-degrading
773 alternative, as determined from the established and ranked and weighted pollutants of
774 concern and the effectiveness of each alternative. Creating a ranked hierarchy of
775 alternatives helps to simplify the applicant's selection of a "preferred"the least
776 degrading, reasonable alternative. The applicant will need to estimate the mass of each
777 parameter removed by each treatment alternative based on the best available
778 information.By ranking alternatives in this way, the applicant can avoid having to
779 perform a detailed economic analysis on the universe of available alternatives, instead
780 focusing efforts on only the "top" or least degrading alternative. In a following step the
781 applicant either selects the "top" alternative as the "preferred" alternative or conducts
782 a more detailed review to justify eliminating that alternative from further consideration
783 (e.g., the option would be too costly).

784 A method for ranking the alternatives suitable for less complex reviews is to
785 qualitatively rate the water quality improvement anticipated for each POC under each
786 treatment alternative. ~~Also, b~~Below is an example scale for determining the benefit of

787 each alternative for the given parameter of concern (Tables 5-1 and 5-2). -The applicant
 788 may propose other qualitative ranking methods as an alternative to the example
 789 provided.

790 Table 5-1: Example Water Quality Improvement Ratings

<u>Water Quality Improvement</u>	<u>Rating</u>
<u>Minor Improvement</u>	<u>1</u>
<u>Fair Improvement</u>	<u>2</u>
<u>Good Improvement</u>	<u>3</u>
<u>Excellent Improvement</u>	<u>4</u>
<u>No Degradation</u>	<u>5</u>

791

792 Table 5-2: Example Qualitative Alternative Rankings by Degradation (from least to most)

<u>Alternatives</u>	<u>POC A</u>		<u>POC B</u>		<u>POC C</u>		<u>Weighted Rating</u>	<u>Rank</u>
	<u>Rating</u>	<u>Weight¹</u>	<u>Rating</u>	<u>Weight¹</u>	<u>Rating</u>	<u>Weight¹</u>		
<u>Alternative 4</u>	<u>5</u>	<u>50%</u>	<u>4</u>	<u>30%</u>	<u>4</u>	<u>20%</u>	<u>4.5</u>	<u>1</u>
<u>Alternative 5</u>	<u>3</u>	<u>50%</u>	<u>5</u>	<u>30%</u>	<u>5</u>	<u>20%</u>	<u>4</u>	<u>2</u>
<u>Alternative 2</u>	<u>4</u>	<u>50%</u>	<u>2</u>	<u>30%</u>	<u>3</u>	<u>20%</u>	<u>3.2</u>	<u>3</u>
<u>Alternative 1</u>	<u>2</u>	<u>50%</u>	<u>3</u>	<u>30%</u>	<u>4</u>	<u>20%</u>	<u>2.7</u>	<u>4</u>
<u>Alternative 3</u>	<u>2</u>	<u>50%</u>	<u>3</u>	<u>30%</u>	<u>2</u>	<u>20%</u>	<u>2.3</u>	<u>5</u>

1: Weighting factor from the ranking and weighting of POCs.

793

794 The applicant should identify situations in which different alternatives are more or
 795 less degrading for individual pollutants. In these cases, the applicant should identify and
 796 document its rationale regarding the alternative that — on the whole — is least
 797 degrading. For example, alternative A might be least degrading for TDS, but result in a
 798 more degradation than alternative B for selenium. If there were a downstream
 799 impairment for TDS, that might influence a decision that the overall least degrading
 800 alternative in our example was alternative A. On the other hand, if there was no
 801 impairment downstream and the assimilative capacity reduction for TDS was 10 percent
 802 and the selenium reduction in assimilative capacity was 75 percent, the preferred
 803 alternative might be alternative B.

804 An example of a detailed quantitative ranking and weighting procedure that would be
 805 appropriate for more complex and detailed analyses is provided in Appendix AB. For
 806 more complex evaluations of alternatives, the ranking of alternatives could be based on
 807 the development of a matrix giving the weighting of each parameter of concern against
 808 each other and the rating of benefit the alternative has for the individual parameter of
 809 concern. The applicant will need to estimate the mass of each parameter removed by
 810 each treatment alternative based on the best available information. Toxic and non toxic
 811 pollutants should be evaluated separately. The rankings and a description of the
 812 rationale for parameter weightings and overall rankings should be compiled and

813 submitted to the DWQ. The following is an example rating matrix that could be used in
 814 this process:

815 Because toxic pollutants differ in their toxicity, the reductions in pollutant discharges
 816 need to be adjusted for toxicity by multiplying the estimated removal quantity for each
 817 pollutant by a normalizing weight, called a toxic weighting factor (TWF). The TWF for
 818 each pollutant measures its toxicity relative to copper, with more toxic pollutants having
 819 higher TWFs. The TWFs can be obtained from multiple sources from EPA, including
 820 EPA's DMR Pollutant Loading Tool (<http://cfpub.epa.gov/dmr/>). The use of toxic
 821 weights allows the removals of different pollutants to be expressed on a constant
 822 toxicity basis as toxic pound equivalents (lb eq) and summed to yield an aggregate
 823 measure of the reduction in pollutant discharge that is achieved by a treatment
 824 alternative (Table 5-3). The treatment alternatives can then be ranked by toxic pollutant
 825 removal (Table 5-4).

826

827 Table 5-3: Example Toxic Pollutant Removal Estimation for a Treatment Alternative

Toxic Parameter	Influent		Effluent		Removal		Toxic Weighting Factor	Removal (lb eq/yr)
	(mg/L)	(lb/day)	(mg/L)	(lb/day)	(lb/yr)	(%)		
Ammonia	1	3.61	0.1	0.36	1,184.3	90%	0.0014	1.7
Arsenic	0.05	0.18	0.005	0.02	59.2	90%	4.04	239.2
Cadmium	0.02	0.07	0.005	0.02	19.7	75%	23.1	456.0
Copper	0.05	0.18	0.005	0.02	59.2	90%	0.63	37.3
Hexavalent chromium	0.05	0.18	0.005	0.02	59.2	90%	0.51	30.2
Iron	0.07	0.25	0.01	0.04	79.0	86%	0.0056	0.4
Lead	0.05	0.18	0.005	0.02	59.2	90%	2.24	132.6
Mercury	0.0001	0.00036	0.0001	0.00036	-	0%	120	0.0
Selenium	0.05	0.18	0.05	0.18	-	0%	1.1	0.0
Silver	0.01	0.04	0.004	0.01	7.9	60%	16.5	130.3
Total chromium	0.05	0.18	0.005	0.02	59.2	90%	0.076	4.5
Total residual chlorine	0.5	1.80	0.01	0.04	644.8	98%	0.509	328.2
Zinc	0.04	0.14	0.005	0.02	46.1	88%	0.047	2.2
Total								1,362.6

828

829 Table 5-4: Example Alternatives Ranking by Pollutant Removal for Toxic Pollutants

Alternative	Removal (lb eq/yr)	Rank
Alternative 4	1,333	1
Alternative 5	1,012	2
Alternative 2	957	3

Alternative 3	886	4
Alternative 1	759	5

830 [For non-toxic pollutants such as TSS, BOD, TN, and TP, due to the varying mass of each](#)
831 [pollutant observed in the discharge, the amount removed needs to be normalized. The](#)
832 [suggested approach is to calculate a unitless removal ratio of pollutant removal for each](#)
833 [alternative to the maximum pollutant removal amongst all of the alternatives \(Table 5-](#)
834 [5\); however, other normalization methods could be appropriate.](#)

835 | Table 5-5: Example Alternatives Ranking by Pollutant Removal for Non-Toxic Pollutants

Alternatives	POCA			POC-B			POC-C			Weighted Removal Ratio	Rank
	Removal (lb)	Removal Ratio ¹	Weight ²	Removal (lb)	Removal Ratio ¹	Weight ²	Removal (lb)	Removal Ratio ¹	Weight ²		
Alternative 4	15	0.75	50%	15	0.50	30%	20	1.00	20%	0.73	1
Alternative 2	15	0.75	50%	10	0.33	30%	20	1.00	20%	0.68	2
Alternative 3	20	1.00	50%	5	0.17	30%	10	0.50	20%	0.65	3
Alternative 1	10	0.50	50%	20	0.67	30%	15	0.75	20%	0.60	4
Alternative 5	8	0.40	50%	30	1.00	30%	10	0.50	20%	0.60	5
Baseline	10	0.50	50%	8	0.27	30%	15	0.75	20%	0.48	6
Maximum	20	-	-	30	-	-	20	-	-	-	-

1: POC removal normalized to maximum removal of all treatment alternatives, i.e. ratio of removal from alternative to max. removal of all alternatives.

2: Weighting factor from the ranking and weighting of POCs.

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<u>Parameters of Concern Removed (Pounds/Year)</u>								
<u>Alternatives</u>	<u>P-1</u>	<u>Weight</u>	<u>P-2</u>	<u>Weight</u>	<u>P-3</u>	<u>Weight</u>	<u>Total Weighted</u>	<u>Ranking</u>
<u>Alternative 4</u>	<u>15</u>	<u>50%</u>	<u>15</u>	<u>30%</u>	<u>20</u>	<u>20%</u>	<u>16.0</u>	<u>1</u>
<u>Alternative 5</u>	<u>8</u>	<u>50%</u>	<u>30</u>	<u>30%</u>	<u>10</u>	<u>20%</u>	<u>15.0</u>	<u>2</u>
<u>Alternative 2</u>	<u>15</u>	<u>50%</u>	<u>10</u>	<u>30%</u>	<u>20</u>	<u>20%</u>	<u>14.5</u>	<u>3</u>
<u>Alternative 1</u>	<u>10</u>	<u>50%</u>	<u>20</u>	<u>30%</u>	<u>15</u>	<u>20%</u>	<u>14.0</u>	<u>4</u>
<u>Alternative 3</u>	<u>20</u>	<u>50%</u>	<u>5</u>	<u>30%</u>	<u>10</u>	<u>20%</u>	<u>13.5</u>	<u>5</u>
<u>Baseline</u>	<u>10</u>	<u>50%</u>	<u>8</u>	<u>30%</u>	<u>15</u>	<u>20%</u>	<u>10.4</u>	<u>6</u>

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Also, below is an example scale for determining the benefit of each alternative for the given parameter of concern.

<u>Ratings</u>	<u>=</u>
<u>Minor Improvement</u>	<u>1</u>
<u>Modest Improvement</u>	<u>2</u>
<u>Reasonable Improvement</u>	<u>3</u>
<u>Good Improvement</u>	<u>4</u>
<u>Excellent Improvement</u>	<u>5</u>

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5.3.27.2 Review Evaluation and Selection of the Preferred of Feasibility of Alternatives

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After ranking the alternatives by degradation, the applicant will need to evaluate whether it would be reasonable to select a less degrading alternative. The factors that determine if an alternative is reasonable are cost effectiveness and affordability. -Cost effectiveness and affordability are addressed in the rule (R317-2-3.5.c), which states:

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"An option more costly than the cheapest alternative may have to be implemented if a substantial benefit to the stream can be realized. Alternatives would generally be considered feasible where costs are no more than 20% higher than the cost of the discharging alternative, and (for POTWs) where the projected per connection service fees are not greater than 1.4% of MAGI (median adjusted gross household income), the current affordability criterion now being used by the Water Quality Board in the wastewater revolving loan program. Alternatives within these cost ranges should be carefully considered by the discharger. Where State financing is appropriate, a financial assistance package

860 may be influenced by this evaluation, i.e., a less polluting alternative may receive
861 a more favorable funding arrangement in order to make it a more financially
862 attractive alternative.”

863 Additional guidance on how to evaluate cost effectiveness and affordability are
864 provided in the sections below.

865 5.3.2.1 Cost Effectiveness

866 An alternative must be cost effective to be considered reasonable. Cost effectiveness
867 should be evaluated in two ways: overall cost increase and unit cost of pollutant
868 removal in comparison to the baseline alternative.

869 The total cost increase of each alternative needs to be estimated. The cost estimate is
870 typically based on a concept level design with limited engineering; sufficient detail in the
871 cost estimate should be provided so that the basis can be verified. The estimate should
872 be the Net Present Value (NPV) of the 20-year life-cycle cost including land acquisition,
873 capital cost, and operation and maintenance (O&M) costs. For simplicity, it may be
874 assumed that the discount rate equals the inflation rate in order to estimate operation
875 and maintenance costs in today’s dollars, i.e. NPV of O&M equals 20 times O&M annual
876 cost. The applicant may propose the use of an alternate discount rate, along with
877 justification. For upgrades to existing facilities, only the cost basis for the upgrade
878 should be considered, i.e. additional capital and O&M costs.

879 In some cases, the applicant will be requested to calculate unit costs for pollutant
880 removal to provide additional information to evaluate the relative cost effectiveness of
881 each of the treatment alternatives. Refer to Appendix AB for detailed procedures for
882 estimating unit costs. ~~toxic Table 5-6: Example Cost Effectiveness of Treatment~~
883 ~~Alternatives for Toxic Pollutant Removal eq-eg~~

884 ~~Since it is not possible to determine an equivalent mass of removal for non-toxic~~
885 ~~pollutants, the unit cost should be presented for each non-toxic pollutant under each~~
886 ~~treatment alternative.~~

887 5.3.2.2 Affordability

888 Although a 20% total cost increase is generally considered the threshold for both cost
889 effectiveness and affordability, the applicant may provide additional information on the
890 affordability of the less degrading alternative.

891 For public sector discharges, alternatives where the projected per connection service
892 fees are not greater than 1.4% of the median adjusted gross household income are
893 generally considered affordable. This is the affordability criterion currently being used
894 by the Water Quality Board for the wastewater revolving loan program. –Secondary
895 socioeconomic factors that can be considered to evaluate affordability for public-sector
896 discharges include debt indicators (such as bond rating and overall net debt),
897 socioeconomic indicators (such as unemployment rate), and financial management
898 indicators (such as property tax revenue and property tax collection rate).

899 For private sector discharges, the determination of the affordability of less degrading
900 alternatives will be based on an evaluation of the effect on profitability, liquidity,
901 solvency and leverage of the entity in comparison to industry benchmarks.

902 Worksheets to assist with the calculation of these economic indicators are available
903 by request from EPA (<http://water.epa.gov/scitech/swguidance/standards/economics/>).

904 ~~The applicant will recommend the preferred alternative to DWQ. DWQ will review~~
905 ~~the ratings developed by the applicant or their consultant. The Alternatives should be~~
906 ~~listed from the one showing the most improvement to the one showing the least~~
907 ~~improvement for water quality from the scores in the matrix. The costs for each~~
908 ~~alternative should be listed with its ranking and the rankings should then be evaluated.~~

909 5.3.2.3 Other Considerations

910 In ~~determining the selected~~selecting the preferred alternative, the following
911 additional items should be considered and evaluated:

912 1. Alternative Operations and Maintenance (O&M) scenarios should be considered
913 in the ranking process. An Alternative O&M scenario will generally be considered
914 feasible if ~~the annual cost increase is no more than 10% of the annual operating~~
915 ~~cost or 20% of the 20-year present worth~~NPV, whichever is less.

916 2. In ~~considering~~evaluating the feasibility of alternatives, the review should
917 consider the current zoning ~~requirement surrounding the facility being evaluated~~
918 for the community surrounding the facility.

919 3. The review of the selected alternative should also include factors such as
920 reliability, maintainability, operability, sustainability, and adaptability to
921 potentially changing discharge requirements.

922 Sustainability for the purposes of this evaluation is defined as the degree that
923 the management method minimizes the depletion or damage to natural
924 resources.

925 ~~3.~~When different alternatives have similar potential to reduce degradation of
926 water quality, other ancillary water quality benefits should be considered such as
927 maintenance or enhancement of instream flow or habitat.

928 4.

929 ~~4.~~Optional mitigation projects may also be included with any selected alternative
930 when it is deemed to be cost effective and environmentally beneficial. If the
931 discharger includes a mitigation project with an alternative, consideration should
932 be given to the expected net benefits to water quality of both the discharge and
933 mitigations when ranking project alternatives.

934 5.

935 ~~7. The review of the selected alternative should also include factors such as~~
936 ~~reliability, maintainability, operability, sustainability, and adaptability to~~
937 ~~potentially changing discharge requirements.~~

938 5. Also included in the review should be consideration of the sensitivity of receiving
939 water and its potential for overall improvement.

940 5.3.3 Selecting the Preferred Alternative

941 Based on all of the factors considered, the applicant will recommend the preferred
942 alternative to DWQ for review and approval.

943 For the DWQ to fairly evaluate alternatives, the following information should be
944 provided for each alternative process:

- 945 1. A technical description of the treatment process.
- 946 2. Rank alternatives from least degrading to most degrading based on the mass of
947 pollutants removed.
- 948 3. Evaluation of cost effectiveness, including estimation of total cost and unit cost
949 for pollutant removal.
- 950 4. Evaluation of affordability, if necessary.
- 951 5. Evaluation of the reliability, maintainability, operability, sustainability, and
952 adaptability of each alternative.

953 5.4 Opportunity for Public Comment and Review Optional Public Notice 954 of the Preferred Alternatives Analysis

955 Once the preferred alternative is selected, an optional public comment period may be
956 conducted by being posted on the DWQ website and being noticed in the State of Utah
957 Public Notice Website (see Section 3.7.16.2). If no optional reviews are conducted, the
958 public has an opportunity to comment during the mandatory UPDES public comment
959 period.

960

Comment [NvS3]: Proposing to delete this consideration for the following reasons: 1) it is unreasonable to expect the applicant and DWQ to assess overall receiving water health and potential for improvement for individual ADRs, which would essentially require a watershed plan and 2) presumably the selected treatment alternative is cost effective/affordable and therefore could be argued should be implemented regardless of overall health.

961 **6.0 LEVEL II ADR: IMPLEMENTATION PROCEDURES FOR**
962 **~~DEVELOPMENT OF A STATEMENT OF SOCIAL, ENVIRONMENTAL,~~**
963 **AND ECONOMIC IMPORTANCE (SEEI)**

964 Beyond the alternatives analysis, the second key component of a Level II ADR is a
965 Statement of Social, Environmental, and Economic Importance (SEEI). The SEEI
966 evaluates the societal benefits of the proposed activity by documenting factors such as:
967 employment, production, tax revenues, housing, and correction of other societal
968 concerns (i.e., health or environmental concerns). This portion of the ADR provides the
969 project proponent the opportunity to document that the overall benefits of the project
970 outweigh any negative consequences to water quality. As a result, the project
971 proponent is best served by making this portion of the ADR as thorough as possible. At
972 a minimum this portion of the review should contain the following:

- 973 1. A description of the communities directly affected by the proposed project,
974 including factors such as: rate of employment, personal or household
975 income, poverty level, population trends, increasing production, community
976 tax base, etc.
- 977 2. An estimate of important social and economic benefits that would be
978 realized by the project, including the number and nature of jobs created and
979 projected tax revenues generated.
- 980 3. An estimate of any social and economic costs of the project, including any
981 impacts on commercial or recreational uses.
- 982 4. A description of environmental benefits of the project and associated
983 mitigation efforts (if any). For instance, if a project would result in an
984 increase in stream flow that would provide additional habitat and a net
985 benefit to stream biota, this benefit would be documented in this section of
986 the review.
- 987 5. Documentation of local government support.

988 As with the Alternatives Analysis portion of the ADR, the size and scope of the SEEI
989 should be commensurate with the size of the proposed project. The applicant may
990 reference existing documents that address alternatives such as [an](#) Environmental
991 Impact Statements. Also, it is in the best interest of the project proponent to make the
992 SEEI as thorough as possible if the project is likely to be controversial.

993

994 **6.1 Regulatory Framework**

995 The need for SEEs comes from 40 CFR 131.12(a)(2), which states, “Where the quality
996 | of waters exceeds levels necessary to support fish, shellfish, and wild-life and recreation
997 | in and on the water, the quality shall be maintained and protected unless the State
998 | finds, ..., that allowing lower water quality is necessary to accommodate social or
999 | economic development in the area in which the waters are located...” (emphasis added).

1000 Accordingly, UAC R317-2-3.5(c)4 specifically calls for SEI demonstrations:

1001 *“Although it is recognized that any activity resulting in a discharge to surface*
1002 *waters will have positive and negative aspects, information must be submitted by*
1003 *the applicant that any discharge or increased discharge will be of economic or*
1004 *social importance in the area.*

1005 *The factors addressed in such a demonstration may include, but are not limited*
1006 *to, the following:*

1007 *(a) employment (i.e., increasing, maintaining, or avoiding a reduction in*
1008 *employment);*

1009 *(b) increased production;*

1010 *(c) improved community tax base;*

1011 *(d) housing;*

1012 *(e) correction of an environmental or public health problem; and*

1013 *(f) other information that may be necessary to determine the social and*
1014 *economic importance of the proposed surface water discharge.”*

1015 |

1016 |

1017

1018 **6.2 Important Considerations in Developing SEEs**

1019 ~~Nonetheless, this section provides guidance for some of the social, environmental,~~
1020 ~~and economic considerations that the applicant may want to include with the SEEI~~
1021 ~~portion of the Level II ADR.~~ The DWQ anticipates that the specific information provided
1022 in the SEEI will vary depending on the nature of the project and the community or
1023 communities that will be affected by the proposed activity. ~~Nonetheless, this section~~
1024 ~~provides guidance for some of the social and economic considerations that the applicant~~
1025 ~~may want to include with the SEEI portion of the Level II ADR.~~ Many of the decisions
1026 relating to the social, environmental, and economic considerations are local in nature
1027 and the local government agencies should be consulted to determine directions that are
1028 appropriate.

1029 The SEEI is about demonstrating that the degradation will support important social,
1030 environmental, and economic development in the local area. The SEEI is not about the
1031 economic benefits to an individual or corporation. Instead, the SEEI is intended to
1032 support an informed public discussion and decision about the pros and cons of allowing
1033 water quality degradation. If the lowering of water quality resulting from the preferred
1034 alternative is not in the overriding public interest, then a lessnon-degrading alternative
1035 must be selected or the permit may-will be denied. If the lowering of water quality is
1036 found to be in the overriding public interest, this finding is documented and submitted
1037 for public comment along with the draft permit incorporating the preferred alternative.

1038 Following are the factors that should be considered while preparing the SEEI:

1039 1. ~~6.2.1~~ Effects on Public Need/Social Services

1040 Identify any public services, including social services that will be provided to or
1041 required of the communities in the affected area as a result of the proposed
1042 project. Explain any benefits that will be provided to enhance health/nursing
1043 care, police/fire protection, infrastructure, housing, public education, etc.

1044 2. ~~6.2.2~~ Effects on Public Health/Safety

1045 Identify any health and safety services that will be provided to or required of
1046 the communities in the affected area as a result of the proposed project.
1047 Explain any benefits that will be provided to enhance food/drinking water
1048 quality, control disease vectors, or to improve air quality, industrial hygiene,
1049 occupational health or public safety. One example is the construction of a
1050 central treatment plant to correct problems with failing septic systems.
1051 Another example might be removal or additions of toxic or bacteriological
1052 pollutants, which reduce life expectancy and increased illness rates.

1053 3. ~~6.2.3~~ Effect on Quality of Life

1054 Describe the impacts of the proposed project on the quality of life for
1055 residents of the affected area with respect to educational, cultural and
1056 recreational opportunities, daily life experience (dust, noise, traffic, etc.) and
1057 aesthetics (viewscape).

- 1059 | 4. ~~6.2.4.~~ Effect on Employment
 1060 | Explain the impacts of the proposed project on employment practices in the
 1061 | affected area. Identify the number and type of jobs projected to be gained or
 1062 | lost as a result of the proposed project. Will the proposed project improve
 1063 | employment or mean household income in the affected area?
- 1064 | 5. ~~6.2.5~~ Effect on Tax Revenues
 1065 | Explain the impact of the proposed project on tax revenues and local or county
 1066 | government expenditures in the affected area. Will the project change
 1067 | property values or the tax status of properties? If yes, explain whether that
 1068 | change is a beneficial or detrimental to residents/businesses in the affected
 1069 | area.
- 1070 | 6. ~~6.2.6~~ Effect on Tourism
 1071 | Discuss the effects the proposed project may have on the economy of the
 1072 | affected area by creating new or enhancing existing tourist attractions.
 1073 | Conversely, describe any impacts resulting from the elimination of or
 1074 | reduction in existing attractions.
- 1075 | 7. ~~6.2.7~~ Preservation of assimilative capacity
 1076 | Review the pros and cons of preserving assimilative capacity for future
 1077 | industry and development. Applicants are encouraged to talk with local
 1078 | stakeholders such as planning, zoning, and economic development officials
 1079 | about their development plans, and should summarize the communities'
 1080 | position on utilizing assimilative capacity for the proposed project versus
 1081 | future plans or needs.
- 1082 | 8. ~~6.2.8~~ Other Factors
 1083 | Provide any other information that would explain why it is necessary to lower
 1084 | water quality to accommodate this proposed project. This category should be
 1085 | used to address any social or economic factors not considered above.

1086 | **6.3 Review and Approval of SEEs**

1087 | Important social, economic or environmental activity refers to an activity that is in the
 1088 | overriding public interest. The ~~Executive Secretary~~Director will generally consider public
 1089 | projects to be necessary to accommodate social and economic growth unless
 1090 | compelling information exists to the contrary. DWQ may consult with local and State
 1091 | planning and zoning agencies to determine whether or not the project is consistent with
 1092 | the long-term plans of affected communities. Information obtained from local planning
 1093 | groups may be compiled with other material obtained through the ADR process. The
 1094 | ~~Executive Secretary~~Director will make a determination. Appeals to the ~~Executive~~
 1095 | ~~Secretary~~Director's decision may be made consistent with the procedures for
 1096 | administrative appeals.

1097 | **6.4 ~~Public Comment Procedures~~Optional Public Notice of the SEEI**

1098 | At a minimum the SEEI material will be submitted for public comment, along with all
1099 | other Level II ADR materials, through the required public comment processes used for
1100 | permit applications and renewals. However, ~~as described in Section 3.5,~~ the applicant
1101 | may include a cursory, or preliminary, SEEI with the work plan, because much of the
1102 | information described in SEEI reports help explain the greater socioeconomic context
1103 | within which the project takes place.

1104

1105 **7.0 SPECIAL PERMIT CONSIDERATIONS**

1106 Most of the implementation procedures discussed in this document are clearly
1107 applicable to UPDES permitting procedures. However, the DWQ also issues other types
1108 of permits, which have special ADR considerations. This portion of the guidance is
1109 incomplete and the reader should contact DWQ for assistance regarding these permits
1110 in the interim.

1111 **7.1 Individual Stormwater Permits**

1112 This portion of the guidance is incomplete and the reader should contact DWQ for
1113 assistance in the interim. Stormwater permits are subject to an ADR unless the impact
1114 to water quality is temporary and limited.

1115 **7.2 General Permits**

1116 A number of discharges to surface waters are authorized under general UPDES
1117 permits issued by the DWQ:

- 1118 • [Concentrated](#) animal feeding operations ([CAFOs](#))
- 1119 • [Concentrated aquatic animal feeding operations](#)
- 1120 • Construction dewatering or hydrostatic testing
- 1121 • [Construction site stormwater](#)
- 1122 • Municipal stormwater
- 1123 • Industrial stormwater
- 1124 • Drinking water treatment plants
- 1125 • Private on-site wastewater treatment systems
- 1126 • ~~Construction sites one acre or larger~~
- 1127 • Coal mining operations
- 1128 • [Discharge of treated groundwater](#)
- 1129 • [Application of pesticides](#)

1130
1131 [New and reissued General Permits will be reviewed for compliance with](#)
1132 [antidegradation provisions as described in this section. The Executive Secretary will](#)
1133 [determine the need for a Level II ADR for General Permits on a case by case basis until](#)
1134 [this implementation guidance is updated to fully address General Permits. New and](#)
1135 [reissued General Permits may require evaluation of the potential for degradation as a](#)
1136 [result of the permitted discharges if the discharges are not temporary and limited.](#)
1137 [DWQ anticipates expanding and revising the ADR guidance for general permits in future](#)
1138 [iterations.](#)

1139 [Individual regulated activities authorized under General Permits through Notice of](#)
1140 [Intent \(NOI\) procedures are covered under the antidegradation review for the General](#)
1141 [Permit and will typically not be required to conduct a Level II ADR. DWQ, after reviewing](#)
1142 [the submitted NOI, may require an eligible discharge to undergo a Level II Review if it is](#)
1143 [determined that significant degradation may occur as a result of cumulative impacts](#)

1144 from multiple discharges to a water body, as a result of impacts from a single discharger
1145 over time, and/or due to the sensitivity of the receiving water.

1146 UPDES General Permits require that discharges authorized under the permit do not
1147 violate water quality standards and best management practices (BMP) contained in the
1148 permit are implemented. Compliance with the terms of the General Permit is required
1149 to maintain authorization to discharge.

1150 An antidegradation review will be conducted for the entire class of general permittees
1151 that are authorized under the General Permit. The antidegradation review will consist of
1152 the following items:

1153 1) *Identify the pollutants that may contribute to water quality degradation.*

1154 The pollutants that are reasonably expected to occur in discharges covered under
1155 the General Permit will be identified. These pollutants will be considered to have
1156 the potential to degrade high quality waters.

1157 2) *Ensure that existing uses of the receiving waters will be protected.*

1158 The discharge of pollutants must not impair the existing uses of receiving waters.
1159 Methods that may be utilized to demonstrate the protection of existing uses
1160 include the determination of water quality based effluent limits (WQBEL) through
1161 a wasteload analysis, acute and/or chronic whole effluent toxicity (WET) testing,
1162 and implementation of best management practices (BMP) for stormwater and best
1163 practicable technology (BPT) for treatment of process water.

1164 3) *Documentation and public notice of the antidegradation review.*

1165 The antidegradation review will be documented and public noticed with the draft
1166 General Permit.

1167 The level of effort of the antidegradation review will depend on the nature of the
1168 General Permit, the number of dischargers anticipated to fall under the permit, and the
1169 sensitivity of the receiving waters; however, the level of effort will typically be limited
1170 since discharges with a significant potential to degrade water quality are required to
1171 obtain an individual discharge permit.

1172 **7.3 §401 Water Quality Certifications**

1173 The Clean Water Act gives authority to each state to issue a 401 Water Quality
1174 Certification (§401 Certification) for any project that needs a Section 404 Permit, NPDES
1175 permit issuance, and FERC hydropower licenses. The §401 Certification is a verification
1176 by the state that the project will not violate water quality standards. DWQ works with
1177 applicants to avoid and minimize impacts to water quality and may require actions on
1178 projects to protect water quality. These required actions are called conditions.

1179 7.3.1 §404 Dredge and Fill Permits

1180 Section 404 of the Clean Water Act regulates the placement of dredged or fill material
1181 into the “waters of the United States,” ~~including small streams and wetlands adjacent~~
1182 ~~or connected to “waters of the United States.”~~ The U.S. Army Corps of Engineers

1183 (USACE) administers the §404 permit program dealing with these activities (e.g.,
1184 wetland fills, in-stream sand/gravel work, etc.) in cooperation with the EPA and in
1185 consultation with other public agencies. Nationwide general permits are issued for
1186 activities with impacts not deemed to be significant. Individual permits are issued for
1187 activities that are considered to have more than minor adverse impacts. For both
1188 individual and nationwide §404 permits, states have an obligation to certify, certify with
1189 conditions, or not certify §404 permits under §401 of the Clean Water Act.
1190 Antidegradation reviews involving the placement of dredged or fill material will be
1191 performed via the §401 Certification process.

1192 Section 73-3-29 of the Utah Code requires any person, governmental agency, or other
1193 organization wishing to alter the bed or banks of a natural stream to obtain written
1194 authorization from the State Engineer prior to beginning work. The Stream Alteration
1195 Program was implemented in 1972 in order to protect the natural resource value of the
1196 state's streams and protect the water rights and recreational opportunities associated
1197 with them. In 1988, the U.S. Army Corps of Engineers issued Regional General Permit 40
1198 (GP-40) which allows an applicant to obtain both state approval and authorization under
1199 Section 404 of the Clean Water Act through a single application process. Although not all
1200 stream alteration activities qualify for approval under GP-40, many minimal impact
1201 projects can be approved under this joint permit agreement.

1202 These activities are subject to ADR requirements (R317-2-3.5.a.1.). ~~This portion of the~~
1203 ~~guidance is incomplete and the reader should contact DWQ for assistance regarding~~
1204 ~~ADRs for these permits in the interim.~~

1205 Antidegradation and compliance with water quality standards will be addressed and
1206 implemented through DWQ's §401 Water Quality Certification process. Applicants who
1207 fulfill the terms and conditions of applicable §404 Permits and the terms and conditions
1208 of the corresponding §401 Water Quality Certification will have fulfilled the
1209 antidegradation requirements. Additional antidegradation considerations may be
1210 incorporated into §404 Permits and the corresponding §401 Water Quality Certifications
1211 at the time of permit issuance. DWQ will not issue a §401 Water Quality Certification
1212 where degradation resulting from the project is not necessary to accommodate
1213 important social, environmental, or economic development.

1214 The decision making process for Individual §404 Permits is contained in the §404(b)(1)
1215 guidelines (40 CFR Part 230) and contains the elements for a Level I and Level II ADR.
1216 Prior to issuing a permit under the §404(b)(1) guidelines, USACE must: 1) make a
1217 determination that the proposed discharges are unavoidable (i.e., necessary); 2)
1218 examine alternatives to the proposed activity and authorize only the least damaging
1219 practicable alternative; and 3) require mitigation for all impacts associated with the
1220 activity. A §404(b)(1) findings document is produced as a result of this procedure and is
1221 the basis for the permit decision. Public participation is also provided for in this process.
1222 Level I and Level II ADRs will be met through §401 Water Quality Certification of
1223 Individual §404 Permits that will typically rely upon the information contained in the
1224 §404(b)(1) findings document. However, if significant water quality degradation may

1225 occur as a result of the proposed activity, DWQ will require the applicant to provide
1226 additional documentation to complete a formal Level II Review.

1227 For activities covered under a Nationwide §404 Permit, the antidegradation review
1228 will be conducted in conjunction with DWQ's review of the Nationwide Permit for §401
1229 Water Quality Certification. The antidegradation review for Nationwide Permits will be
1230 conducted by DWQ similar to the process for UPDES General Permits (Section 7.2). For
1231 minor activities covered under Nationwide Permits (e.g., road culvert installation, utility
1232 line activities, bank stabilization, etc.), antidegradation requirements will be deemed to
1233 be met if all appropriate and reasonable BMPs related to erosion and sediment control,
1234 project stabilization, and prevention of water quality degradation are applied and
1235 maintained. The §401 Water Quality Certification may place additional conditions upon
1236 the Nationwide Permit to prevent or minimize water quality degradation.

1237 7.3.2 Federal Energy Regulatory Commission Licenses

1238 The Federal Energy Regulatory Commission (FERC) licenses the operation of dams that
1239 generate hydroelectric power. Applicants for these licenses are required to obtain §401
1240 Water Quality Certification. Antidegradation and compliance with water quality
1241 standards will be addressed and implemented through DWQ's §401 Water Quality
1242 Certification process. Applicants who fulfill the terms and conditions of an applicable
1243 FERC license and the terms and conditions of the corresponding §401 Water Quality
1244 Certification will have fulfilled antidegradation requirements. DEQ will not issue a §401
1245 Water Quality Certification where degradation resulting from the project is not
1246 necessary to accommodate important social or economic development.

1247 Hydroelectric dams affect water quality in the impounded reservoir and in the
1248 downstream receiving water. The antidegradation review for the water quality
1249 certification will focus on the degradation in water quality that may result from the
1250 construction of the dam and operation of the reservoir. DWQ may place conditions on
1251 operations or require other actions to mitigate the effects on water quality.

1252 As part of the antidegradation review for the §401 Water Quality Certification for a
1253 FERC License, DWQ will require the applicant to complete a formal Level II Review if
1254 significant water quality degradation may occur.

1255 When a project undergoes relicensing with FERC, the relicensing certification process
1256 will compare the water quality under the current FERC license with projected water
1257 quality in the future under the proposed FERC license. If this comparison shows no
1258 additional degradation in water quality, then a Level II Review will not be required.

1259

1260 **8.0 ISSUES FOR FUTURE ITERATIONS OF THE IMPLEMENTATION**
1261 **GUIDANCE**

1262 ~~As discussed in Section 1.0, the initial versions of this guidance focus on UPDES~~
1263 ~~permits with the exception of general permits.~~ For the topics listed below in Section
1264 ~~8.7.1,~~ the guidance is incomplete. The existing guidance provided for these topics
1265 represents DWQ's current thinking but is incomplete and should be applied with
1266 caution. For activities requiring ADRs, but not yet completely addressed in guidance, the
1267 permittee should consult DWQ for assistance. These ADRs will be conducted on a case-
1268 by-case basis consistent with the requirements of R317-2-3.

1269 **8.1 Planned Future Additions to the Guidance**

- 1270 ~~1. Glossary. A glossary of that defines important terms used in the guidance will be added~~
1271 ~~to future iterations.~~
- 1272 ~~2. Acronym Key. A key that identifies the acronyms used in the guidance will be added to~~
1273 ~~future iterations.~~
- 1274 ~~3. References. References will be added to future iterations of the guidance.~~
- 1275 ~~4. Temporary and Limited. Guidance on how to determine if a discharge qualifies as~~
1276 ~~temporary and limited will be added to future iterations.~~
- 1277 ~~5. General permits and 401 Certifications. General Permits that are subject to ADR~~
1278 ~~requirements include:~~
- 1279 ~~Animal Feeding Operations (AFOs),~~
1280 ~~Construction dewatering or hydrostatic testing,~~
1281 ~~Municipal stormwater,~~
1282 ~~Industrial stormwater,~~
1283 ~~Drinking water treatment plants, Private on-site wastewater treatment systems~~
1284 ~~Stream alteration permits,~~
1285 ~~Construction sites one acre or larger,~~
1286 ~~Coal mining operations and,~~
1287 ~~Discharge of treated groundwater.~~
- 1288 1. Stormwater Permits. Guidance for municipal, industrial and construction stormwater
1289 permitting.
- 1290 2. Pretreatment Program. Guidance for how antidegradation provisions should be applied to
1291 the pretreatment program.
- 1292

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1303 **APPENDIX A**
 1304 **EXAMPLE PROCEDURES FOR RANKING AND WEIGHTING**
 1305 **PARAMETERS OF CONCERN AND ALTERNATIVES**

1306 This appendix provides example procedures for ranking and weighting parameters of
 1307 concern and alternatives that would be appropriate for more complex reviews.

1309 **A-1 Ranking and Weighting Parameters of Concern**

1310 This section provides an example of how to quantitatively rank and weight toxic
 1311 parameters that may be appropriate for more complex reviews. Example ranking and
 1312 weighting calculations shown below are provided in the *UDWQ ADR Spreadsheet Tools*
 1313 that are a companion to this guidance document.

- 1314
- 1315 1. Determine the assimilative capacity of the receiving water for each pollutant.
 1316 The assimilative capacity is determined by comparing the ambient concentration
 1317 in the receiving water to the water quality criteria for each pollutant. Ambient
 1318 concentration is characterized by a summary statistic such as the average or 80th
 1319 percentile value of the data. The water quality criteria can be found in UAC
 1320 R317-2-14 and may be temperature, pH and/or hardness dependent. An
 1321 example calculation of the assimilative capacity in the receiving water is shown
 1322 in Table A-1.

1323

1324 Table A-1: Example Assimilative Capacity Determination

<u>Parameter of Concern</u>	<u>Ambient Concentration (mg/L)</u>	<u>Water Quality Criteria (mg/L)</u>	<u>Assimilative Capacity</u>	
			<u>Used¹</u>	<u>Available²</u>
<u>A</u>	<u>0.85</u>	<u>1.25</u>	<u>68%</u>	<u>32%</u>
<u>B</u>	<u>0.06</u>	<u>0.95</u>	<u>6%</u>	<u>94%</u>
<u>C</u>	<u>2.5</u>	<u>5.0</u>	<u>50%</u>	<u>50%</u>

1325

1: Assimilative Capacity Used = (Ambient Concentration/Water Quality Criteria) * 100
2: Assimilative Capacity Available = 100 – Assimilative Capacity Used

- 1326
- 1327 2. Determine the toxic weighting factor for each pollutant.
 1328 EPA derives TWFs from chronic aquatic life criteria (or toxic effect levels) and
 1329 human health criteria (or toxic effect levels) established for the consumption of
 1330 fish in order to account for differences in toxicity across pollutants and to
 1331 provide the means to compare mass loadings of different pollutants (EPA 2012).
 1332 EPA considers TWFs appropriate for use in the calculation of cost-effectiveness
 1333 values because such values only serve as indicators of the relative cost
 1334 effectiveness of treatment technology options and not as absolute metrics.

1335 EPA has calculated TWFs for 1,064 chemicals and the equations and results for
 1336

1351 **A-2 Ranking Alternatives**

1352 This section provides an example of how to quantitatively rank alternatives for more
1353 complex reviews. Example ranking and weighting calculations shown below are
1354 provided in the *UDWQ ADR Spreadsheet Tools* that are a companion to this guidance
1355 document.

1356 **Evaluation of Degradation**

1357 For more complex evaluations of alternatives, the ranking of alternatives should be
1358 based on the development of a matrix giving the weighting of each parameter of
1359 concern and the mass of pollutant removed by each alternative. The applicant will need
1360 to estimate the mass of each parameter removed by each treatment alternative based
1361 on the best available information. Toxic and non-toxic pollutants should be evaluated
1362 separately.

1363 Example procedures for ranking the alternatives for toxic pollutants are provided
1364 below:

1365 **1. Estimate the amount removed of each pollutant for each alternative.**

1366 Based on the best available information, estimate the amount of each
1367 pollutant removed, or not discharged to the receiving water, for each
1368 alternative. Because toxic pollutants differ in the amount that is considered
1369 toxic, the reductions in pollutant discharges need to be adjusted for toxicity by
1370 multiplying the estimated removal quantity for each pollutant by a normalizing
1371 weight, called a toxic weighting factor (TWF). The TWF for each pollutant
1372 measures its toxicity relative to copper, with more toxic pollutants having
1373 higher TWFs. The use of toxic weights allows the removals of different
1374 pollutants to be expressed on a constant toxicity basis as toxic weighted
1375 pound-equivalents (TWPE, lb-eq) and summed to yield an aggregate measure
1376 of the reduction in pollutant discharge that is achieved by a treatment
1377 alternative (Table A-3).

1378 EPA has calculated TWFs for 1,064 chemicals and the equations and results for
1379 calculating TWFs are contained in a set of Excel Worksheets known as the TWF
1380 Database (EPA 2008).

1381

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Table A-3: Example Toxic Pollutant Removal Estimation for an Alternative

<u>Toxic Parameter</u>	<u>Influent</u>		<u>Effluent</u>		<u>Removal</u>		<u>Toxic Weighting Factor</u>	<u>TWPE Removal (lb-eq/yr)</u>
	<u>(mg/L)</u>	<u>(lb/day)</u>	<u>(mg/L)</u>	<u>(lb/day)</u>	<u>(lb/yr)</u>	<u>(%)</u>		
<u>Ammonia</u>	<u>1</u>	<u>3.61</u>	<u>0.1</u>	<u>0.36</u>	<u>1,184.3</u>	<u>90%</u>	<u>0.0014</u>	<u>1.7</u>
<u>Arsenic</u>	<u>0.05</u>	<u>0.18</u>	<u>0.005</u>	<u>0.02</u>	<u>59.2</u>	<u>90%</u>	<u>4.04</u>	<u>239.2</u>
<u>Cadmium</u>	<u>0.02</u>	<u>0.07</u>	<u>0.005</u>	<u>0.02</u>	<u>19.7</u>	<u>75%</u>	<u>23.1</u>	<u>456.0</u>
<u>Copper</u>	<u>0.05</u>	<u>0.18</u>	<u>0.005</u>	<u>0.02</u>	<u>59.2</u>	<u>90%</u>	<u>0.63</u>	<u>37.3</u>
<u>Hexavalent chromium</u>	<u>0.05</u>	<u>0.18</u>	<u>0.005</u>	<u>0.02</u>	<u>59.2</u>	<u>90%</u>	<u>0.51</u>	<u>30.2</u>
<u>Iron</u>	<u>0.07</u>	<u>0.25</u>	<u>0.01</u>	<u>0.04</u>	<u>79.0</u>	<u>86%</u>	<u>0.0056</u>	<u>0.4</u>
<u>Lead</u>	<u>0.05</u>	<u>0.18</u>	<u>0.005</u>	<u>0.02</u>	<u>59.2</u>	<u>90%</u>	<u>2.24</u>	<u>132.6</u>
<u>Mercury</u>	<u>0.0001</u>	<u>0.00036</u>	<u>0.0001</u>	<u>0.00036</u>	<u>-</u>	<u>0%</u>	<u>120</u>	<u>0.0</u>
<u>Selenium</u>	<u>0.05</u>	<u>0.18</u>	<u>0.05</u>	<u>0.18</u>	<u>-</u>	<u>0%</u>	<u>1.1</u>	<u>0.0</u>
<u>Silver</u>	<u>0.01</u>	<u>0.04</u>	<u>0.004</u>	<u>0.01</u>	<u>7.9</u>	<u>60%</u>	<u>16.5</u>	<u>130.3</u>
<u>Total chromium</u>	<u>0.05</u>	<u>0.18</u>	<u>0.005</u>	<u>0.02</u>	<u>59.2</u>	<u>90%</u>	<u>0.076</u>	<u>4.5</u>
<u>Total residual chlorine</u>	<u>0.5</u>	<u>1.80</u>	<u>0.01</u>	<u>0.04</u>	<u>644.8</u>	<u>98%</u>	<u>0.509</u>	<u>328.2</u>
<u>Zinc</u>	<u>0.04</u>	<u>0.14</u>	<u>0.005</u>	<u>0.02</u>	<u>46.1</u>	<u>88%</u>	<u>0.047</u>	<u>2.2</u>
<u>Total</u>								<u>1,362.6</u>

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2. Rank the alternatives based on total equivalent weight removed.

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Using the total toxic weighted pound equivalents removed, rank the alternatives (Table A-4).

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Table A-4: Example Alternatives Ranking by Toxic Pollutant Removal

<u>Alternative</u>	<u>Removal (lb-eq/yr)</u>	<u>Rank</u>
<u>Alternative 4</u>	<u>1,333</u>	<u>1</u>
<u>Alternative 5</u>	<u>1,012</u>	<u>2</u>
<u>Alternative 2</u>	<u>957</u>	<u>3</u>
<u>Alternative 3</u>	<u>886</u>	<u>4</u>
<u>Alternative 1</u>	<u>759</u>	<u>5</u>

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For non-toxic pollutants such as TSS, BOD, TN, and TP, due to the varying mass of each pollutant observed in the discharge, the amount removed needs to be normalized. The suggested approach is to calculate a unitless removal ratio of pollutant removal for each alternative to the maximum pollutant removal amongst all of the alternatives (Table A-5); however, other normalization methods could be appropriate.

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Table A-5: Example Alternatives Ranking by Pollutant Removal for Non-Toxic Pollutants

Alternatives	POC A			POC B			POC C			Weighted Removal Ratio	Rank
	Removal (lb)	Removal Ratio ¹	Weight ²	Removal (lb)	Removal Ratio ¹	Weight ²	Removal (lb)	Removal Ratio ¹	Weight ²		
Alternative 4	15	0.75	50%	15	0.50	30%	20	1.00	20%	0.73	1
Alternative 2	15	0.75	50%	10	0.33	30%	20	1.00	20%	0.68	2
Alternative 3	20	1.00	50%	5	0.17	30%	10	0.50	20%	0.65	3
Alternative 1	10	0.50	50%	20	0.67	30%	15	0.75	20%	0.60	4
Alternative 5	8	0.40	50%	30	1.00	30%	10	0.50	20%	0.60	5
Baseline	10	0.50	50%	8	0.27	30%	15	0.75	20%	0.48	6
Maximum	20	-	-	30	-	-	20	-	-	-	-
<p>1: POC removal normalized to maximum removal of all treatment alternatives, i.e. ratio of removal from alternative to max. removal of all alternatives.</p> <p>2: Weighting factor from the ranking and weighting of POCs.</p>											

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1396 [Evaluation of Cost Effectiveness](#)

1397 [In some cases, the applicant will be requested to calculate unit costs for pollutant](#)
1398 [removal to provide additional information to evaluate the relative cost effectiveness of](#)
1399 [each of the treatment alternatives. The unit cost of toxic pollutant removal is calculated](#)
1400 [using the total cost of the alternative and the equivalent pollutant mass removed that](#)
1401 [was previously determined \(Table A-6\).](#)

1402 [Table A-6: Example Cost Effectiveness of Alternatives for Toxic Pollutant Removal](#)

Alternative	Total Cost	Total Cost Increase	Pollutant Removal (lb-eq)	Unit Cost (\$/lb-eq/yr)	Unit Cost Increase
Alternative 1	\$1,100	10%	14	\$78.57	-18.3%
Alternative 2	\$1,400	40%	14.5	\$96.55	0.4%
Alternative 3	\$1,300	30%	13.5	\$96.30	0.1%
Alternative 4	\$2,000	100%	16	\$125.00	30.0%
Alternative 5	\$1,500	50%	15	\$100.00	4.0%
Baseline	\$1,000		10.4	\$96.15	

1403
1404 [Since it is not possible to determine an equivalent mass of removal for non-toxic](#)
1405 [pollutants, the unit cost should be presented for each non-toxic pollutant under each](#)
1406 [alternative.](#)